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Biological
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Sydney. Botanic Gardens
Report... 1898

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(1899.)
(THIRD SESSION.)

(LEGISLATIVE ASSEMBLY.)
(NEW SOUTH WALES.)

BOTANIC GARDENS AND DOMAINS, &c.

(REPORT ON, FOR THE YEAR 1898.)

Printed under No. 3 Report from Printing Committee, 22 August, 1899.

The Director of the Botanic Gardens to The Principal Under Secretary.

Botanic Gardens, Sydney, 24 June, 1899.

Sir,

I have the honor to submit a Report on the Establishments under my control for the year 1898.

The year in question has been a period of drought and consequent anxiety, yet I hope the conditions of the various gardens and parks will be found to be satisfactory.

I have the honor to be,
Sir,
Your obedient Servant,
J. H. MAIDEN,
Director.

CONTENTS OF REPORT.

Botanic Gardens.

Introductory.
Arrangement Ground.
Other beds and borders.
Lawns.
Boundaries and fences.
Plant houses.
New buildings.
National Herbarium.
Botanical Museum.
Public lectures.
Departments of Agriculture and Forests.
Collecting and botanising tours.
Publications.
Guide to Gardens.
Sewerage.
Water supply.
Roads and paths.
Labelling.
Spraying.
Oka (a new vegetable).
Correspondence.
Seeds received and despatched.
Living plants received and despatched.
Herbarium specimens.
Publications acquired by gift.
Publications acquired by purchase.
Aviary.

Government

Government Domains.

Introductory.
Carriage roads.
Footpaths.
Removal of old trees.
Tree-planting during the year.
Grass.
Water supply.
Lighting.
Seats.
Railings and fences.
Tree-guards.
Painting.
Refuse.
Public latrines.
Music.
Cricketing and other games.
Bathing.
Insect pests.
Weeds.
Visitors.
Government House Gardens.
Miscellaneous.

Garden Palace Grounds.

Water supply.
Removal of fence between Garden Palace Grounds and Botanic Gardens.
Painting.
Top-dressing of lawns.
Soil for new border.

Centennial Park.

Tree-planting.
Tree-guards.
Protection of native vegetation.
Native flower plantation.
Collection of native grasses, Cyperaceæ, &c.
Effects of the continued drought.
Tarring and metalling of roads and paths.
Road between Queen and Ocean Streets.
The ride.
Cyclists.
Erection of buildings.
Band stand.
Latrines.
Reservoir (Sydney Water Supply).
Statuary.
Water fowl.

State Nursery, Campbelltown.

Distribution of plants.
Preparation of plants for season of 1899.
Seeds and plants received.
The weather.
Water supply.
Improvements.

Botanic Gardens.

Introductory.—In my last Report I enumerated the Annual Reports that had been issued from this establishment so far as I knew them. The Director of the Royal Gardens at Kew has drawn my attention to the fact that, in addition to those mentioned, reports were issued for 1856, 1857, and 1858. I have been able to procure a copy of the 1856 Report (dated 14th March, 1857); the other two Reports I have not yet seen.

Arrangement Ground.—Some of the Natural Order plots in the Monocotyledonous Arrangement Ground have been raised with new soil, and the plants re-arranged. Extensive alterations have taken place here which have rendered this section of enhanced educational value. Following are some further details of the improvements. A much larger area even than was rendered available last year is now devoted to Australian grasses, and about twenty-four (24) species were added to the collection during the year. Alongside these, as a matter of convenience of reference, a large bed of forage plants, or reputed forage plants, has been established. This bed contains specimens of the best forage-plants, together with those which have been from time to time advertised as such, often, it is feared, without accurate reference to their actual merits. The bed of exotic grasses has been largely denuded of duplicates as they have flowered, and a number of species added that were not hitherto in the collection. Additions have been made to the Liliaceæ, chiefly by the addition of indigenous species. Such orders as the Commelyneæ have been removed, as it was considered that the space they occupied could be more profitably employed.

These changes, with re-arrangement of the verges, have enabled me to establish beds for the Juncæ, Restiaceæ, and Cyperaceæ. These orders were practically non-existent in the Arrangement Ground, and very poorly represented in any part of the Garden; but largely through the assistance of Mr. W. Forsyth in collecting suitable plants, these three interesting and important orders are now fairly well represented, and their future improvement is only a matter of time.

Following are the Natural Order beds in the Arrangement Ground at the present time. The numbers preceding each order are those of Bentham and Hooker's *Genera Plantarum*. I may observe that additional orders are grouped together in other parts of the Garden. At the present time the Dicotyledonous Arrangement Ground is separated from that of the Monocotyledons by a considerable interval. I think that undesirable; and inasmuch as it is desired to have additional orders represented in the Arrangement Ground, I desire to take the first opportunity of connecting the two grounds by additional Natural Order beds, made in the narrow lawn which is adjacent to both.

DICOTYLEDONS.

1. Ranunculaceæ.
2. Dilleniaceæ.
10. Papaveraceæ.
11. Cruciferæ.
13. Resedaceæ.
18. Pittosporeæ.
20. Polygalaceæ.
22. Caryophyllaceæ.
31. Malvaceæ.
32. Sterculiaceæ.
33. Tiliaceæ.
38. Geraniaceæ.
39. Rutaceæ.
49. Rhamneæ.
50. Ampelideæ
51. Sapindaceæ.
57. Leguminosæ.
58. Rosaceæ.
59. Saxifrageæ.
60. Crassulaceæ.
67. Myrtaceæ.
68. Melastomaceæ.
69. Lythrarieæ.
74. Passifloreæ.
75. Cucurbitaceæ.
78. Cacteæ.
79. Ficoideæ.
80. Umbelliferæ.
83. Caprifoliaceæ.
84. Rubiaceæ.
85. Valerianeæ.
88. Compositæ.
89. Stylideæ.
90. Goodeniaceæ.
91. Campanulaceæ.
93. Ericaceæ.
95. Epacrideæ.
104. Oleineæ.
106. Apocyneæ.
107. Asclepiadeæ.
112. Borragineæ.
113. Convolvulaceæ.
114. Solanaceæ.
115. Scrophularineæ.
120. Bignoniaceæ.
122. Acanthaceæ.
125. Verbenaceæ.
126. Labiateæ.
131. Chenopodiaceæ.
134. Polygonaceæ.
144. Proteaceæ.
145. Thymelaceæ.
151. Euphorbiaceæ.
153. Urticeæ.
166. Cycadeæ.

MONOCOTYLEDONS.

170. Scitamineæ.
171. Bromeliaceæ.
172. Hæmadoraceæ.
173. Irideæ.
174. Amaryllideæ.
176. Dioscorideæ.
178. Liliaceæ.
186. Juncaceæ.
187. Palmæ.
188. Pandaneæ.
191. Aroideæ.
198. Restiaceæ.
199. Cyperaceæ.
200. Gramineæ.

Other Beds and Borders.—In the Lower Gardens additional flower-beds have been made, and several borders have been enlarged. The additional space thus obtained has been almost exclusively devoted to florists' flowers. The borders in the "Old or Middle Garden" adjoining the Garden Palace Grounds have been cleared, trenched, new soil added, and prepared for replanting. These beds run north and south and are east of the corrugated iron fence that formerly existed in this situation and which has been referred to under "Boundaries and Fences." This is one of the most prominent and most frequently patrolled areas in the Garden, and in place of the common trees and rampant growing shrubs found here, a selection of choice plants will be put out in the autumn.

Lawns.—The alterations to and top-dressing of lawns have been neither numerous nor important during the past year. The chief work under this head has been the top-dressing and levelling of the lawn between the lately-removed boundary between the Palace Garden and the Lower Botanic Gardens. About 200 loads of soil have been used in this work.

Boundaries and Fences.—For many years an iron railing separated the Palace Garden from the Lower Garden, its direction being north-east or south-west. This has been removed and re-erected between the Palace Garden and the Middle Garden, its direction being north and south. It has taken the place of an unsightly corrugated iron fence which had remained in position since the International Exhibition of 1879–80, forming an unsightly barrier between the two Gardens. There is now an unbroken vista along the Palace Garden and Lower Garden lawns—a charming view which attracts the attention of all lovers of the beautiful. I have referred to this matter in my Report on the Palace Garden (Garden Palace Grounds).

Plant-houses.—No changes have taken place here except some minor repairs, but tenders have been called for very extensive repairs to all our glass-houses, and for new pit and plant frames. An order has been sent to England for an iron hot-house, uniform in design with those of two already in the Garden, while tenders have been called in the Colony for a hot-house to be specially devoted to tropical Australian and Polynesian orchids. I trust, therefore, in my next Report, to have satisfactory information to communicate in regard to our plant-houses.

New Buildings.—Packing and potting sheds and store-rooms, together with a kitchen and dining-room for the men, have been erected during the year.

The packing-shed is a continuation of the existing stable buildings in an easterly direction, and a room, 35 feet by 18 feet, is provided, together with a loft for packing material. Great saving of labour and economy of time have resulted through the situation and the arrangement of this building. Parallel with this, and at a distance of 48 feet from it, is the building which contains a lofty potting shed, 23 feet by 13 ft. 6 in.; two store-rooms, 11 feet x 13 ft. 6 in. and 15 feet by 13 ft. 6 in. respectively; a men's kitchen, 11 feet by 13 ft. 6 in., adjoining which is a room, 19 feet by 13 ft. 6 in., which is used as a dining and recreation room. It is plainly but sufficiently furnished, and is much appreciated by the staff. The parallel lines of buildings are joined at their north-easterly and south-easterly corners by a substantial fence, thus forming a quadrangle.

The buildings are of brick, and were erected by Mr. J. Meeks at a contract price of about £600.

National Herbarium.—In my last Report I hoped to be able to announce that a suitable building to house the herbarium would be ready for occupation. This has not yet been realised, but the Government Architect has designed a commodious building of handsome design which will be in keeping with its beautiful surroundings. As I write, a tender for its erection has been let; so I trust that my hope of last year may be realised during the present one.

The particulars given on pages 10 and 11 give some idea of the progress made in the acquisition of herbarium specimens. They do not, however, indicate the collections of Australian plants made by my staff and myself and by willing coadjutors all over the Colony. I have been so busy in acquiring and naming specimens, that I have had no time to take a census of them, but I think the number of named species in the herbarium at the end of the year is not less than 15,000.

Messrs.

Messrs. Betche, Camfield and I have been engaged chiefly upon the phanerograms and vascular cryptogams, Mr. W. Forsyth on the mosses, and Mr. A. Grant on the fungi. The lichens and algæ have been put in order. Parliament has been pleased to vote a sum of money for the purchase of the lichen herbarium of the Rev. F. R. M. Wilson of Melbourne; this is, I believe, the finest collection of these plants in Australia. In my next Report I hope to announce that I have taken it over, and I will give some particulars of its contents.

Much attention has been given, during the past year, to the collection and investigation of plants from the Polynesian Islands.

Botanical Museum.—This is an adjunct to the herbarium, its contents consisting mainly of specimens which cannot be placed in the herbarium because they are too large, too clumsy, or because they are preserved in liquid. Its arrangement is precisely similar to that of the herbarium—Bentham and Hooker's *Genera Plantarum* being followed as closely as possible.

Besides the specimens to illustrate systematic botany, the Museum contains teratological specimens; garden plants affected by insect-pests (for these I am mainly indebted to the kindness of Mr. W. W. Froggatt, Government Entomologist); photographs and other pictorial illustrations of indigenous and other vegetation; photographs and other portraits of Australian botanists, and of those out of Australia who have identified themselves with Australian botany.

The specimens in the Museum by no means illustrate systematic botany merely, but also morphology and physiology. A special effort has been made to secure teratological specimens.

Public Lectures.—Having obtained a number of photographic views of landscapes and of interesting plants in the Botanic Gardens, I caused them, to the number of about ninety, to be made into lantern slides, and used them to illustrate a lecture I had been invited to give at the Y.M.C.A. in August. Opportunity was taken to give the large audience information which could only be given in a personally-conducted tour of the Gardens. The early history and development of the Gardens were dealt with, and information given in regard to the botany and economic uses of some of the plants. I repeated the lecture in September (St. James' Church), and in October (Randwick), and had to decline other invitations because of the demands on my time. If I could I would deliver many of these lectures during the winter months, particularly in the country districts, and thus give country people interesting information in regard to the Gardens of which they are so justly proud, but in regard to which they rarely receive guidance and instruction.

Departments of Agriculture and Forests.—I have received a large number of papers from these Departments for report during the year, but as I have made brief Annual Reports to both these Departments, they need not be repeated here.

Collecting and Botanising Tours.—Following are the principal journeys I have made:—

1. Mount Kosciusko, January.
2. Jenolan Caves, February and other months.
3. Lord Howe Island, March and April.
4. Melbourne (Herbarium), June.
5. Dubbo and Narromine districts, and Harvey Range, September.
6. Clarence Siding (highest point of Blue Mountains), September.
7. Appin (over some of Allan Cunningham's, and Sir William Macarthur's collecting grounds), September.
8. Shoalhaven gullies, October.
9. King's Table-land and edge of Burragorang Gorge, October.
10. Mount Tomah (Allan Cunningham's collecting ground in 1822), November.
11. Tenterfield district, and Dividing Range as far south as Mount Spiraby, east of Bolivia Station, December.

Some accounts of Trip No. 1 will be found in the *Agricultural Gazette* for July, 1898; of Trip No. 3, in the *Proceedings of the Linnean Society of New South Wales* for 1898.

On Trip No. 9 I was accompanied by Mr. W. Forsyth. In addition to the above, collecting trips were undertaken by Mr. E. Betche to the Walcha district, in December; by Mr. W. Forsyth to Mount Warning and the Tweed River district; by Mr. J. L. Boorman to the Dubbo district in December, and the Wyong district in October and other months; by Mr. J. H. Camfield to many collecting-grounds readily reached from Sydney.

By all members of the staff systematic collecting and recording of botanical observations were undertaken, with the double view of the enrichment of the herbarium and the acquisition of materials for a systematic botanical survey of the Colony.

Publications.—Following are the publications made either by me, or in co-operation with others:—

With Henry Deane, M.A., &c.

1. On the White Ash of Southern New South Wales (*Eucalyptus fraxinoides, n.sp.*)
2. Notes on the Eucalypts of New South Wales, No. 4.

The following species are dealt with:—

E. piperita, Sm.
E. pilularis, Sm.
E. acmenoides, Sieb.
E. Sieberiana, F.v.M.
E. Sieberiana, var. *Oxleyensis*, nov. var.
E. Planchoniana, F.v.M.
E. eugenioides, Sieb., var. *nana*, nov. var.

Both papers published in the *Proceedings of the Linnean Society of New South Wales.*

With W. S. Campbell, F.L.S.

3. The Flowering Plants and Ferns of New South Wales. Small 4to. Part 7. With four coloured plates. (Government Printer, Sydney.)

With Ernst Betche.

4. Notes from the Botanic Gardens, Sydney, No. 2.
   Oxylobium ellipticum, R. Br. var. *alpinum*, var. nov.
   Leptospermum lanigerum, Sm. var. *macrocarpum*, var. nov.
   Baeckea virgata, Andr. var. *polyandra*, var. nov.
   Podolepis longipedata, A. Cunn., var. *robusta*, var. nov.
   Also records of *Epacris mucronulata*, R. Br., *Pimelea axiflora*, F.v.M. var. *alpina*, and *Phyllanthus Mitchelli*, Benth., as new for the Colony.
5. Descriptions of four new species of Australian Plants (*Eugenia brachyandra, Verticordia darwinioides, Rulingia procumbens, Rulingia prostrata*).
6. Notes on *Sterculia* (*Brachychiton*) *lurida* and *discolor*.

7. Notes from the Botanic Gardens, Sydney, No. 3.
   Elæocarpus longifolius, C. Moore.
   Boronia ledifolia, J. Gay., var. *glabra*, var. nov.
   Rupicola sprengelioides, gen. et sp. nov.
   Grevillea juniperina, R. Br.; var. *trinervata*, var. nov.
   Ricinocarpus Bowmanni, F.v.M., var. *albus*, var. nov.
   Potamogeton ochreatus, Raoul.
   The above were published in the *Proceedings of the Linnean Society of New South Wales.*
8. On a new *Myoporum* from South Australia. (*M. refractum*). (*Proceedings of the Royal Society of South Australia.*)

With J. H. Camfield.

9. Notes on some Port Jackson Plants (*Banksia, Boronia, Sprengelia*). (*Proceedings of the Linnean Society of New South Wales.*)

Following are my miscellaneous publications during the year:—

1. A Manual of the Grasses of New South Wales. Royal 8vo., pp. 199, with twenty illustrations. (Government Printer, Sydney.)
2. Some Eucalypts of the New England Table-land. (*Proceedings, Australian Association for the Advancement of Science, VII.*)
3. Notes on a trip to Mount Seaview, Upper Hastings River. (*Proceedings of the Linnean Society of New South Wales, XXIII.*)
4. Observations on the Vegetation of Lord Howe Island. (*Proceedings of the Linnean Society of New South Wales, XXIII.*)

Following is a list of the most important of the miscellaneous articles contributed by me to the *Agricultural Gazette of New South Wales*, and appearing in the 1898 issues of that publication. Some of these articles are illustrated:—

1. Useful Australian Plants, No. 49—The Pigmy Panic Grass (*Panicum pygmæum*, R. Br).
2. No. 50.—The Stringybarks of New South Wales.
3. Some Food-plants of the Aborigines.
4. Mount Seaview, and the way thither.
5. A contribution towards a Flora of Mount Kosciusko.
6. A study of the Prickly-pears naturalised in New South Wales.
7. Indigenous Vegetable Drugs (in two parts).
8. A chat about Wattles.
9. Some Exotic Grasses, No. 1.—Prairie Grass (*Bromus unioloides*, H.B. et K).
10. New South Wales Weeds—Nut Grass (*Cyperus rotundus*, Linn.).

Guide to Gardens.—I regret that the Guide to the Gardens is not yet ready for the printer. I have spent much labour upon it during the past year, but it is very time-absorbing, and I have many other claims on my time; yet knowing how useful a guide will be to visitors, I am doing all I can to expedite its issue.

Sewerage.—Perhaps the most noteworthy improvement effected during the year has been the system of drainage carried out by the Sewerage Construction Branch of the Public Works Department, which has amply and permanently provided for nearly all the sanitary requirements of the Gardens. These sewers, which comprise a length of about 26 chains, consist of 6-in. diameter stoneware pipe sewers, jointed in cement compo., and laid at suitable depths to intercept the sewerage from the various buildings, stables, lodges, &c., throughout the grounds. The main line rises at the foot of the Palace Garden slopes, near the orchid houses, and follows the course of one of the main avenues in a generally south-easterly direction to near the Botanical Museum, where it receives two branch lines, one draining the upper and the other the lower portions of the Gardens. Thence it continues through the Outer Domain towards Woolloomooloo Bay, into which a temporary outlet pipe has been provided pending the completion of the Woolloomooloo low-level sewer system now in progress, when the drain from the Gardens will be connected with the pumping station in Forbes-street, and the discharge lifted into the ordinary high-level or gravitation sewers.

Every precaution was taken during the work to prevent damage to the plants or disfigurement to the Gardens, and the pipes being nearly altogether laid in tunnel through rock at a considerable depth, do not proclaim their existence in any undue or unpleasant fashion, while the attractions even of Sydney's fairest Paradise will be in no small degree enhanced by a perfect system of drainage. For purposes of inspection, flushing, and ventilation, shafts substantially built in concrete have been provided, while inlet pipes have been left to connect the various buildings with the sewers. The works, which cost some £1,400, are now complete, and have proved thoroughly efficient in action.

Water Supply.—Following is the registered supply of water during the year:—

Meter No. 205.—Botanic Gardens. Lower portion; also for birds, &c.	5,000,000 gallons.
Meter No. 279.—Upper Gardens, near Macquarie-street, Domain	847,000 „
Meter No. 207.—Garden facing Farm Cove and water-closets	1,111,000 „
Total	6,958,000 „

Roads and Paths.—Endeavour has been made to keep these in as good order as possible, but I am not satisfied with them yet. Several walks have been regravelled—(*e.g.*) walk along Azalea border; also that part of Mrs. Macquarie's Road in the Lower Garden which is between the north end of the aviary and the middle gate. The sides of the walk near the large hot-house—which walk was much disturbed by the sewerage operations—have been reguttered with a neat glazed drain of hemispherical section, and edged with turf.

Labelling.—This necessary work has been pushed on as well as our resources have permitted, but at present the whole of not even one man's time can be devoted to this important duty.

As regards florist's flowers, the commoner shrubs, and the better-known orchids, an experiment has been made of purchasing several hundreds of cast-zinc labels with raised lettering, and these labels are now on trial.

Spraying.—I think it is generally agreed that the Garden is freer from insect pests at the end than at the beginning of the year. This result has been arrived at, not so much by spraying as by destroying diseased plants or portions of them, and by carefully eradicating old worn-out trees and other plants wherever it was possible to spare them. In this way we have not only got rid of a number of unsightly plants, but the conditions of the neighbouring ones have been ameliorated.

We

We have an excellent spraying plant, and have done a little spraying, but not as much as I should have liked to have done, for lack of labour. I look forward to the day when we shall be in a position to continuously employ one man on the work of combating insect pests in the Garden. It would be his duty to spray and adopt other means for dealing with pests, and also, by systematic inspection of the whole of the Garden, to detect, at as early a stage as possible, any fresh insect attacks on a plant. It would also be his duty to critically examine every plant received in the Garden from outside with respect to its freedom from pests. This duty is carried out carefully at the present time, but it should, I think, be the special work of one man.

Oka (*a new vegetable*).—On the 18th January, 1898, the Director of the Royal Gardens at Kew wrote me as follows:—"I am sending you a few tubers of *Oxalis crenata*, the 'Oka' of the Peruvians, which is worth a trial as a vegetable for table. The tubers should be planted 3 feet apart in sandy soil, and treated like a potato. New tubers are formed at the end of the season, and, under favourable conditions, they are 3 inches long, and weigh 2 oz. When lifted they should be exposed to sunlight for two or three days. To cook them, boil for twenty minutes in water containing a pinch of carbonate of soda. They change to a bright amber colour, and if eaten with pepper and salt they are palatable, and of a pleasant flavour."

Five and a half oz. were planted on the 14th March, and 26 oz. were harvested on the 22nd July. This is not a conclusive test as to yield, as of course the tubers were planted out of season, but the test will be continued. As regards the flavour, I may say that I boiled one or two on the 7th October. They remind one both of potato and of a sweet potato, and are decidedly palatable.

Correspondence.—Letters registered from 1st January to 31st December, 1898, 4,451, being 632 more than during the corresponding period of 1897.

Letters despatched from 1st January to 31st December, 1898, 3,795, being 523 more than during the corresponding period of 1897.

As usual, the requests for information are of the most varied character, and a reply to a particular letter often involves so much research, and may be of such real public interest, that it would be published for general information did the Botanic Gardens possess a *Bulletin* of its own, as do so many institutions of a similar character. The lack of a special publication is, however, at the present very little felt, as I can address the public on botanical and economic matters in the columns of the *Agricultural Gazette*.

Seeds received and despatched.

BOTANIC GARDENS.

Received.

Arnold Arboretum, Jamaica Plain, Mass., U.S.A.—
Packet of seeds of an arborescent palm.

Baroda, India, State Gardens—
22 packets miscellaneous seeds.

Berlin—
29 packets miscellaneous seeds.

Buitenzorg, Java—
24 packets palm seeds.

Calcutta—
1 packet *Ficus altissima* seed.
1 packet *Mucuna imbricata* seed.

California University (Garden of Native Plants), Berkeley—
169 packets miscellaneous seeds.
1 packet seeds from Brindloe Island, 580 miles from Ecuador.

Ceylon—
10 packets miscellaneous seeds.

Christiania, Norway—
29 packets miscellaneous seeds.

Grenada, W. Indies—
1 packet *Myrospermum frutescens* seed.
1 packet *Prestœa montana* seeds.

Groningen, Holland—
20 packets miscellaneous seeds.

Guiana, British, Georgetown—
1 packet *Licuala grandis* seeds.

Hanbury, Chev., The Gardens, La Mortola, Italy—
43 packets miscellaneous seeds.

Hobart, Tasmania—
2 oz. seed *Eucalyptus urnigera*.

Jamaica, Botanical Department—
9 packets miscellaneous seeds.

Despatched.

Adelaide—
80 packets N. S. Wales seeds.

Antwerp—
53 packets N. S. Wales seeds.

Baroda, India, State Gardens—
60 packets N. S. Wales seeds.

Belgrade, Servia—
53 packets N. S. Wales seeds.

Berlin—
125 packets N. S. Wales seeds.

Breslau—
53 packets N. S. Wales seeds.

Bucharest, Roumania—
53 packets N. S. Wales seeds.

Buitenzorg, Java—
166 packets N. S. Wales seeds.

Calcutta—
45 packets N. S. Wales seeds.

California University (Garden of Native Plants), Berkeley—
113 packets miscellaneous seeds.

Catania, Sicily—
64 packets N. S. Wales seeds.

Ceylon—
15 packets N. S. Wales seeds.

Christiania, Norway—
55 packets N. S. Wales seeds.

Cracow, Austria—
30 packets N. S. Wales seeds.

Dublin (Glasnevin)—
168 packets N. S. Wales seeds.

Edinburgh—
117 packets N. S. Wales seeds.

Erlangen, Bavaria—
37 packets N. S. Wales seeds.

Freiburg i. B., Germany—
29 packets N. S. Wales seeds.

Geneva—
73 packets N. S. Wales seeds.

Grenada, W. Indies—
3 packets N. S. Wales seeds.

Groningen, Holland—
55 packets N. S. Wales seeds.

Guiana, British, Georgetown—
26 packets N. S. Wales seeds.

Hanbury, Chev., The Gardens, La Mortola, Italy—
44 packets N. S. Wales seeds.

Harvard University, Botanic Garden, Cambridge, Mass., U.S.A.—
108 packets N. S. Wales seeds.

Hobart, Tasmania—
110 packets N. S. Wales seeds.

Kew—
271 packets miscellaneous seeds.
Eucalyptus seeds.

Received.	*Despatched.*
	Lausanne, Switzerland— 55 packets N. S. Wales seeds.
	Lemberg, Austria— 46 packets N. S. Wales seeds.
	Lille, France— 45 packets N. S. Wales seeds.
	Lyons, France— 53 packets N. S. Wales seeds.
Madras Agri.-Hort. Society Gardens— 10 packets miscellaneous seeds.	
Madrid— 57 packets miscellaneous seeds.	Madrid— 107 packets N. S. Wales seeds.
Montpellier, France— 35 packets miscellaneous seeds.	Montpellier, France— 97 packets N. S. Wales seeds.
	Melbourne— 47 packets N. S. Wales seeds.
	Nantes, France— 55 packets N. S. Wales seeds.
	Naples, Italy— 49 packets N. S. Wales seeds.
Natal (Durban)— 1 bag seed, *Tricholæna rosea.*	Natal (Durban)— 164 packets seeds from Australia and other countries.
Nonmea, New Caledonia Jardin d'Essai— 1 package seed, *Cerbera Manghas.* 1 ,, *Cykokentia Viellardii.* 1 ,, *Pandanus macrocarpa.* 1 ,, *Cycas sp.* 1 ,, *Araucaria Cookii.*	Nonmea, New Caledonia, Jardin d'Essai— 103 packets N. S. Wales seeds.
Odessa, Russia— 32 packets miscellaneous seeds and specimens of *Ephedra vulgaris.*	Odessa, Russia— 49 packets N. S. Wales seeds.
Ootacamnnd, India— 10 packets miscellaneous seeds.	
	Oxford, England— 63 packets N. S. Wales seeds.
	Palermo, Sicily— 75 packets N. S. Wales seeds.
Paris (Museum d' Histoire Naturelle)— 59 packets miscellaneous seeds.	
	Reunion— 4 packets N. S. Wales seeds.
Rome— 17 packets miscellaneous seeds.	Rome— 129 packets N. S. Wales seeds.
Saharanpur, India— 3 packets seeds (*Phœnix rupicola*).	Saharanpur, India— 3 packets N. S. Wales seeds.
Siena, Italy— 31 packets miscellaneous seeds.	Siena, Italy— 64 packets N. S. Wales seeds.
Singapore— Seeds of *Mezoneurum Sumatrana.* ,, *Heptapleurum Hullettii.*	Singapore— 3 packets N. S. Wales seeds.
	St. Paulo, Brazil— 47 packets N. S. Wales seeds.
	St. Petersburg, Russia— 106 packets N. S. Wales seeds.
	Stockholm, Sweden— 43 packets N. S. Wales plants.
	Tiflis, Caucasus— 53 packets N. S. Wales seeds.
Trieste, Austria— 35 packets miscellaneous seeds.	Trieste, Austria— 43 packets N. S. Wales seeds.
Trinidad (Botanical Department)— Seeds of *Mucuna sp.* ,, *Sabal umbraculifera.*	
Utrecht, Holland— 32 packets miscellaneous seeds.	Utrecht, Holland— 53 packets N.S. Wales seeds.

OTHER BOTANICAL ESTABLISHMENTS.

Received.	*Despatched.*
Berkeley, California Floral Society— 20 packets Californian seeds.	Berkely, California, Floral Society— 39 packets N. S. Wales seeds.
Cape Town. Professor MacOwan, Government Botanist— 12 packages miscellaneous seeds.	
	Cape Town Department of Agriculture— 1 packet *Trigonella suavissima* seed.
Columbia, British, Department of Agriculture— 7 packets miscellaneous seeds.	
	France, Consul-General for, Sydney— 29 packets grass and fodder plants.
	Haarlem, Holland ; Koloniaal Museum— 23 packets N. S. Wales seeds.
New South Wales, Department of Agriculture— 15 packets miscellaneous seeds.	N. S. Wales, Department of Agriculture— Seeds of *Trigonella suavissima* to the various experimental farms.
Forest Department, New South Wales— Seeds of *Acacia implexa.*	
Bell, M., National Park— 1 packet *Telopea speciosissima.*	
Technological Museum, Sydney— Various N. S. Wales seeds.	Technological Museum, Sydney— Fruits of Lord Howe Island plant.
	Norway and Sweden, Sydney, Consul for— Seeds of six species N.S. Wales *Coniferæ.*
	India, the Director of Land Records, N.W. Provinces and Oudh— 12 packets grass seeds.
Queensland. Colonial Botanist. Brisbane (F. M. Bailey)— Fruits of *Costus lamingtonii* and *Fragræa obovata*, var. *papuana*, from New Guinea.	
	South Australian Agricultural Bureau, Adelaide— Seeds of *Laurus camphora.* Seeds of *Paspalum dilatatum.*
	S. Australia, National Park, Belair, The Trustees— 8 packets N. S. Wales seeds.

Received.

Despatched.

United States America, Department of Agriculture, Washington—
193 packets N. S. Wales and other seeds, and 20 packets grass and fodder seeds.
Vienna Horticultural Society—
9 packets N. S. Wales seeds.

FIRMS AND PRIVATE INDIVIDUALS.

Received.

Despatched.

Barling, J., Darlinghurst—
1 packet seed, *Passiflora Herbertiana.*
Betts, C. M., Gladesville—
1 packet seed of a *Spondias.*
Brown, Rev. Dr. George, 318, George-street—
2 pods of *Theobroma Cacao* from Samoa.
Buysman, Dr., Middleburg, Holland—
10 packets grass seeds.
33 packets miscellaneous seeds.

Buysman, Dr., Middleburg, Holland—
18 packets N. S. Wales seeds.

Carter, Charles, King-street, Sydney,
5 packets seeds.
Craig, Rev. J. H., Norton-street, Leichhardt—
Seeds of *Abrus precatorius.*
Cullen, Hon. W. P., M.L.C., Mosman—
6 packets native seeds.

Cullen, Hon. W. P., M.L.C., Mosman—
3 packets N. S. Wales seeds.

Cundall, C. H., Manila, Philippine Islands—
1 packet seed, *Myrmecodia sp.*
Seeds of three species of palms.

Cundall, C. H., Manila, Philippine Islands—
32 packets N. S. Wales seeds.

Dall, James, Collingwood, New Zealand—
Seeds of *Astrebla pectinata* and *Tricholæna rosea.*
Edwards, R. S., Corunna, Canada—
Seeds of *Telopea speciosissima.*

Fardell, H. L., Kumanota, Japan—
5 packets miscellaneous seeds

Fardell, H. L., Kumanota, Japan—
6 packets N. S. Wales seeds.

Ferguson & Co., 19 Royal Arcade—
Collection of pansy seeds.

Geissler, Max, Nurseryman, Görlitz, Silesia, Germany—
50 packets N. S. Wales seeds.

Greenlaw, Mrs., The Kiosk, Government Domain—
1 bulb of a liliaceous plant, and seeds of five ornamental plants cultivated in New Zealand.
Griffiths, G. H., 369, George-street—
1 packet seed, *Araucaria Bidwilli.*

Harvey, R. Inglis, Manly—
10 packets salt-bush seed.
1 packet tree-lucerne seed.

Herbe and Wulle, Messrs., Naples—
16 packets miscellaneous seeds.

Kerkhoven, A. E., Java—
30 packets N. S. Wales Eucalyptus seed.
6 ,, ,, Acacia seeds.
18 packets miscellaneous N. S. Wales seeds.

King, Miss, Homebush—
1 packet seed.
Lascelles, A., Neutral Bay—
28 packets of Indian seeds.

Lascelles, A., Neutral Bay—
Seeds of *Doryanthes Palmeri.*

Little, Robert, & Co., Sussex-street—
1 packet palm seeds from South Sea Islands.

Longe, Rev. F. E. G., Suffolk, England
14 packets N. S. Wales seeds.
Menzel, O. E., South Australia—
30 packets N. S. Wales seeds.

Menzel, O. E., South Australia—
23 packets miscellaneous seeds.
25 packets Australian seeds.
Moore, F. H., 7, Gresham-street—
Pods of *Acacia Farnesiana.*
Seeds of *Acacia sp.*
Flower-heads of a Composite.
Seeds of *Trigonella suavissima.*
A few pods of 7-year old beans, from the Gascoigne District, West Australia.
Fruits and seeds of several West Australian plants.
Norton, Hon. Dr., Sydney—
3 packets seeds.
Patterson, George, Queensland—
1 packet seed, *Leucadendron argenteum.*
Perez, G. V., Teneriffe—
1 bag of Tagosaste (*Cytisus proliferus*) seed.

Perez, G. V., Teneriffe—
11 packets N. S. Wales Acacia seeds.

Rabe, J., D.D.S., San Francisco—
12 packets miscellaneous seeds.
Robinson, Isaac, Norfolk Island—
1 bag *Areca Baueri* seed.
3 bags *Araucaria excelsa* seed.

Runge, A., Sumatra—
17 packets N. S. Wales seeds.
Sander, F. & Co., St. Albans, England—
22 packets miscellaneous seeds.

Sander, F. & Co., St. Albans, England—
8 packets miscellaneous seeds.
Steel, Thomas, care of Colonial Sugar Refining Company, Sydney—
Box ripe fruits of *Ficus* for experimental purposes.
Tate, W. C., Oporto, Portugal—
22 packets N. S. Wales seeds.
Walker, W. H., Tenterfield—
1 packet *Trigonella suavissima* seed.
1 ,, *Ammophila arundinacea* seed.
Wellford, Dr., Selangor, Straits Settlements—
17 packets N. S. Wales seeds.
Zouch, C. G., Sydney—
12 packets miscellaneous seeds.

Zouch, C. G., Sydney—
1 packet *Trigonella suavissima* seed.

Living Plants Received and Despatched.

Received.

Adelaide, Botanic Gardens—
Collection of succulents and willows.

Brisbane, Botanic Gardens—
3 plants *Dendrobium speciosum*, var. *Hillii.*
Colonial Sugar Refining Co., Sydney—
Fiji plants for experimental purposes.
Deane, Henry, M.A., Engineer-in-Chief for Railways, Sydney—
Cuttings of *Thunbergia coccinea.*
Dublin (Glasnevin) Royal Botanic Gardens—
Bulbs of 18 varieties *Nerine.*
Fiji, Botanic Station—
1 case *Piper methysticum.*
Gelding, John, Sydney—
6 varieties of *Canna.*
Gregson, Jesse, Newcastle—
1 case *Dendrobium Kingianum*, and collections of other native orchids.
Hore, Captain, s.s. "John Williams"—
15 miscellaneous plants from South Sea Islands.

Lascelles, A., Neutral Bay—
1 plant, *Indigofera pulchella.*
McManamey, H., Mortlake—
4 plants, *Nepenthes Kennedyi*, from Possession Island, Torres Straits—
Melbourne, Botanic Gardens—
Living specimens of *Opuntia.*
Natal (Durban) Botanic Gardens—
A specially valuable collection of 214 miscellaneous plants and 22 bulbs.
Noumea, New Caledonia, Jardin d'Essai—
3 plants *Jatropha manihot.*
70 ,, *Araucaria Cookii.*
Queensland Colonial Botanist, Brisbane (F. M. Bailey)—
Ginger Rhizomes from New Guinea
Rhizomes of *Nymphæa Lotus* (white variety.)

Rockhampton, Botanic Gardens—
30 plants *Nymphæa gigantea.*
Sander, F. and Co., St. Albans, Herts, England—
109 miscellaneous plants and 180 bulbs.
Seligman, Dr., London—
1 plant *Myrmecodia armata*, and 2 tubers from Saibac Island, collected by the donor.

Smith, Mrs., Goderich, Bayswater Road, Sydney—
Valuable collection of Orchids, &c., as per list :—
2 *Brassia Lawrenceana.*
28 *Calanthe* var.
13 *Cattleya* var.
1 *Cœlogyne cristata.*
1 *Cœlogne pandurata.*
1 *Cymbidium pendulum.*
1 *Cypripedium Harrisianum.*
1 ,, *grande (selenipedium.)*
2 ,, *Spicerianum.*
1 ,, *calophyllum.*
1 ,, *longifolium (selenipedium.)*
,, (Red ,, .)
1 ,, *Sedeni (selenipedium.)*
1 ,, *selligerum.*
1 ,, *Leeanum*, var. *superbum.*
1 ,, *Chamberlainianum.*
1 ,, *villosum.*
1 ,, *insigne*, var. *maulei.*
1 ,, *marmorophyllum.*
1 ,, *barbatum.*
1 ,, ,, var. *nigrum.*
1 ,, *Lawrenceanum.*
1 ,, *bellatulum.*
2 ,, unnamed.
20 *Dendrobium nobile.*
1 ,, *fimbriatum oculatum.*
3 ,, *bigibbum.*
1 ,, *primulinum.*
5 ,, *densiflorum.*
1 ,, *Farmeri.*
2 ,, *undulatum.*
1 ,, *Devonianum.*
1 ,, *moschatum.*
1 ,, *Brymerianum.*
1 ,, *Johannis*

Despatched.

Bendigo, Public Gardens—
Piece of Lace-plant (*Ouvirandra*).
Bergin, Mr., Sydney—
Roots of ramie.

Fiji, Botanic Station—
15 miscellaneous plants.

Kanematsu, F., 8, O'Connell-street, Sydney, for the Imperia Gardens, Tokyo, Japan—
25 species of orchids.
Kerkhoven, A. E., Java—
41 miscellaneous plants.
Kew, Royal Gardens—
22 miscellaneous plants.

Noumea, New Caledonia, Jardin d'Essai—
2 cases, 6 bundles plants.

Robinson, Isaac, Norfolk Island—
48 miscellaneous plants.

Sander, F. and Co., St. Albans, Herts, England—
18 miscellaneous plants.

Selkirk, H., Sydney—
1 plant *Hæmanthus sanguineus.*

Received.

1 *Dendrobium cretaceum.*
2 ,, *aggregatum.*
1 ,, *chrysanthum.*
1 ,, *albo-sanguineum.*
1 ,, *Parishii.*
2 ,, *Pierardi.*
1 ,, *sp.*
2 *Eria sp.*
4 *Lælia* var.
2 *Maxillaria Harrisoniæ.*
2 *Phaius maculata.*
1 ,, *assamica.*
1 *Peristeria elata.*
4 *Saccolabium sp.*
1 *Vanda gigantea.*
1 *Phalænopsis Schilleriana.*
1 *Caladium Verdi.*
1 ,, *Raymond Lemoinier*
1 ,, *unnamed.*
1 *Croton sp.*
1 *Cordyline Knausei.*
1 ,, *Knoxii.*
1 *Torenia.*
8 *Gesnera* seedlings.
1 *Davallia sp.*
2 *Microlepia hirta cristata.*
1 *Aspidium sp.*
4 *Gaillardia*, James Kelway.
2 *Hemerocallis.*
1 *Primula.*
1 *Aurum.*
1 *Richardia*, white.
1 *Rhapis humilis.*

Sydney Technological Museum, (R. T. Baker, Curator.)
1 plant *Acianthus fornicatus.*
1 ,, *Corysanthes bicalcarata.*
2 ,, *Cheilanthes tenuifolia.*
3 tubers *Caladenia clavigera.*
4 *Pterostylis sp.*

Tait, W. C. Oporto, Portugal.
Bulbs of mixed wild Portuguese Narcissus.
Pseudo-narcissus (var. *Garret.*)
Triandrus Johnstoni.
Natural Hybrid.

Thompson Mr., care of Rev. Mr. Plume, Hornsby Junction—
14 small native orchids.

Wharton, Mrs., Yokohama, Japan—
2 bulbs each of 17 species Japanese lilies.

Westmacott, Mr., Macquarie-street—
1 tuber from Vavau, Tonga.

Despatched.

Sydney Technical College. Fresh specimens for the Botany class, as required.

Whitelaw, Thomas, Melbourne—
Cuttings of *Alternanthera amœna.*
,, ,, *versicolor.*

Whitelegge, Thomas, Sydney—
56 miscellaneous plants.

Living Plants despatched from 1st June to 31st December, 1898.

Public Schools, number of consignments	299
Roman Catholic Churches, number of consignments	26
Roman Catholic Convents, number of consignments	23
Church of England Churches, number of consignments	20
Wesleyan Churches, number of consignments	14
Presbyterian Churches, number of consignments	10
Union Churches, number of consignments	3
Parks and Recreation Reserves, number of consignments	58
Gaols, Court-houses, and Police Lock-ups, number of consignments	36
Railway Stations, number of consignments	35
Municipal Councils and Public Streets, number of consignments	45
Post Offices, number of consignments	18
Hospitals, number of consignments	14
Cemeteries, number of consignments	2
Miscellaneous, including Experimental Farms, Sewage Farms, Military Stations, also a few private persons by way of exchange, number of consignments	21
Total	624

Made up as follows :—

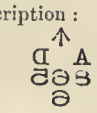
Trees	23,845
Shrubs	19,074
Miscellaneous plants	2,720
Total	45,639

Plants distributed for public purposes.

Herbarium Specimens exchanged.

Received.

Australian Museum, Sydney—
65 species of Lichens and Algæ from Mount Kosciusko, Port Jackson, and New Zealand.
37 species Phanerogams and Ferns from Blue Mountains, N. S. Wales, Lord Howe Island, and China.
2 Cones, branches, and timber of Erromanga (*Dammara*) Pine, New Hebrides.
Tree blazed with inscription :



Despatched.

Received.

Baagoe, J., Næstved, Denmark—
30 species of European *Potamogetons.*

Biltmore Herbarium, North Carolina, U.S.A.—
500 species North American plants.
Buitenzorg, Java Botanic Gardens—
102 Carpological specimens, chiefly of tropical plants.
Berkeley, California, University of California—
472 specimens of North American plants.

Cape Town, Government Botanist—
230 species South African plants. (Professor MacOwan's contributions contain many of his numbered types, so that our Cape herbarium may be of standard record, and usable with the published floræ.)

Copineau, Mons. C., and Mouillefarine, Mons. M., France—
839 species of European plants.
D'Alton, St. Elroy, Nhill, Victoria—
16 species of rare Victorian plants (mallee country).

Menzel, O. E., S. Australia—
81 species of exotics and South Australian plants.
100 species of North American plants.

Queensland Colonial Botanist, Brisbane—
394 species of Queensland plants.
Rodway, L., Hobart—
120 species of Tasmanian plants.
Technological Museum, Sydney—
133 herbarium specimens.
48 species fruits.
Tisdall, H. T., Melbourne—
25 species of Victorian algæ.

Victoria, Conservator of Forests, Melbourne—
1 case cones and seeds.
Victoria, National Herbarium, Melbourne—
Miscellaneous Australian plants.
Vienna, Naturhistorisches Hof Museum—
100 species of Cryptogams.

Walter, C., Melbourne—
603 specimens of Victorian plants.
180 specimens of West Australian plants.

Whitelegge, Thomas, Sydney—
60 species of N. S. Wales Hepaticæ, including types of new species described by Carrington, Pearson, and Stephani; also plates and sheets of illustrations of new Hepaticæ.

Despatched.

Baagoe, J., Næstved, Denmark—
Australian species of *Potamogeton.*
Berlin Botanical Museum—
429 species of Australian plants.
Biltmore Herbarium, North Carolina, U.S.A.
434 species of Australian plants.

Berkeley, California, University of California—
34 species of *Eucalyptus.*
71 species of *Acacia.*
Cape Town, Government Botanist—
416 species of Australian plants.

Cape Colony, Conservator of Forests (Eastern Division)—
19 species of N. S. Wales *Eucalyptus.*
Cape Colony, Conservator of Forests (Western Division)—
19 species of N. S. Wales *Eucalyptus.*
Copineau, Mons. C., and Mouillefarine, Mons. M., France—
780 species of Australian plants.
D'Alton, St. Elroy, Nhill, Victoria—
36 species of N. S. Wales plants.
Darwin, Prof. Francis, Cambridge, England—
9 botanical specimens.
Heckel, Prof. E., Institut Coloniale, Marseille, France—
100 species of N. S. Wales plants.
Herb and Wulle, Messrs., Naples, Italy—
20 species of Australian fruits and seeds.
Kew Royal Gardens—
Several species of Lord Howe Island and rare N. S. Wales plants.
Menzel, O. E., S. Australia—
181 species of N. S. Wales plants.

Natal (Durban), Botanic Gardens—
100 species of N. S. Wales plants.
Queensland, Colonial Botanist, Brisbane—
33 species of N. S. Wales *Eucalyptus.*
Rodway, L., Hobart—
148 species N. S. Wales plants.
Technological Museum, Sydney—
43 herbarium specimens.

Tisdall, H. T., Melbourne—
48 species of Australian and African Proteaceæ.
39 species of Australian and exotic Rutaceæ.
United States, Department of Agriculture, Washington, D.C., U.S.A.—
Parcel of fungi.
Victoria, Conservator of Forests, Melbourne—
63 species of fruits and cones, chiefly Australian.
Victoria, National Herbarium, Melbourne—
Miscellaneous plants, chiefly exotics.
Vienna, Naturhistorisches Hof Museum—
100 species N. S. Wales plants.
34 species N. S. Wales Eucalyptus and certain Cryptogams.
Walter, C., Melbourne.
210 specimens of N. S. Wales plants.

Western Australia Bureau of Agriculture, Perth—
100 specimens of weeds naturalied in Australia.
200 species N. S. Wales plants.

Herbarium specimens presented.—In addition to the very large number of correspondents of the Botanic Gardens who send specimens for identification, following is a list of the principal contributors to the herbarium during the past year:—

Alkin, Rev. T. V., Campbelltown.
Brown, F. H., Port Moresby, New Guinea—
125 specimens of plants from the Astralobe Range.
Campbell, J. F., Walcha.
Gregson, Jesse, Mount Wilson.
Griffiths Bros., George-street—
Samples of Kola Nut.
Groom, Miss, Sydney—
Specimens of Tasmanian plants.
Hamilton, A. G., Mount Kembla.
Hore, Captain, s.s. "John Williams"—
Coral blocks, with mosses, from Funafuti and Raratonga.
Palmer, E. G. W., Lawson.
Rumsey, H. J., Barber's Creek.

Herbarium specimens purchased.

250 specimens of 40 species, also 447 species of South Australian plants.
Six bound volumes of Harvey's Australian seaweeds, containing 493 species determined by him.
1,162 species of rare South African plants (Schlechter's collections).

Publications acquired by gift.

REPORTS AND OTHER PUBLICATIONS OF BOTANIC GARDENS.

Europe.

Amsterdam, Botanic Gardens. Ritzema Bos, Prof. J. (and G. Stals). Tijdschrift over Plantenziekten. Derde Jaargang, 1897. (From the Director.)

Kew Bulletin of Miscellaneous Information for the year 1898, also Kew Bulletin additional series, No. 1. (From the Director.)

Hooker's Icones Plantarum. New series. Vol. vi, Part III, April, 1898. (From the Bentham Trustees.)

Marseilles. Annales de l'Institut Coloniale de Marseille. Vols. iii and iv. Vol. 5, Fasc. 1. (From Prof. E. Heckel.)

Palermo, Italy. Revisione Monografica della specie del Genera Nigella. (A. Terracciano.) 8vo., pp. 57. 1897-8.

I nettarii estranzuiale nelle (Bombaceæ). Tav. xv-xviii. 8vo., pp. 55. (Estratto dalle Contribuzioni alla biologia vegetale. Vol. ii, Fasc. ii. Palermo, 1898.)

Siena, Italy. Bulletino del Laboratorio Botanico della R. Universita di Siena. Anno 1, Fasc. 1, 2 and 3.

Tiflis, Caucasus. Bulletin of the Botanic Gardens. Vol. ii. (1897.)

Asia.

Buitenzorg, Java. Botanic Gardens. Koningsberger, Dr. J. G. Eersee overzicht der Schadelijke en Nuttige Insecten van Java.

Greshoff, M. Tweede verslag van Het Onderzoek naar de Plantenshoffen van Nederlandsch-Indie. (From the Director.)

Koorders, S. H. and Valeton, Th. Bijdrage No. 1, tot de Kennis der Boomsoorten van Java. (Addimenta ad cognitionem Floræ Javanicæ auctoribus. Pars. I. Arbores.) Batavia, 1894.

Ceylon. Circulars of the Royal Botanic Gardens. Nos. 1 to 8. Report of the Director for, 1897. (From the Director.)

Calcutta. King, G. and Pantling, R. Annals of the Royal Botanic Gardens, Calcutta. The Orchids of the Himalaya. Vol. viii, Part I, letterpress; Vol. viii, Part II, plates of Melaxideæ; Vol. viii, Part III, plates of Epidendreæ and Vanda; Vol. viii, Part IV, plates of Listreæ and Cypripedieæ.

Proceedings of the Agri-Horticultural Society of Madras for October, 1897, to June, 1898. Report of the Annual Meeting of the Agri-Horticultural Society of Madras, held on 28th March, 1898. (From the hon. secretary.)

Saharanpur. Report on the progress and condition of the Government Botanic Gardens, Saharanpur and Arnigadh, for the year ending 31st March, 1898. (From the Superintendent.)

Singapore.—Report on the Botanic Gardens for the year 1897. (From the Director.)

Africa.

Natal (Durban) Botanic Gardens—
New Natal Plants, Vol. i, Part I and II; by J. Medley Wood and Maurice S. Evans.
Report on Natal Botanic Gardens for the year 1897.
Colonial Herbarium Report for the year 1897.
(From the Curator).

Old Calabar. Botanical Station. Annual Report for the year 1895-6. (From the Curator.)

Zanzibar. Department of Agriculture. Annual Report of the Department of Agriculture for the year 1897. (From the Director.)

America.

Arechavaleta, J. Anales del Museo Nacional de Montevideo, Tome ii, Fasc. VIII; Tome iii, Fasc. IX. (From the author.)

California. University of Berkeley, Cal. Staphia; a new genus of meliceæ and other noteworthy grasses; by J. Burt Davy. (From the author.)

Missouri. Ninth Annual Report of the Missouri Botanic Gardens, St. Louis. (From the Director.)

Harvard College, U.S.A. Annual Report of the President and Treasurer. (From Professor Goodale.)

Annual Report on public buildings and grounds for 1872 and 1873. Annual report upon the improvement and care of the public buildings and grounds in the district of Columbia and Washington Aqueduct for the years 1874 to 1897. (From the Board of International Exchanges, Sydney.)

Barbadoes. Botanical Station—
Report of the results obtained on the experiment fields at Dodds' Reformatory, 1897.
Occasional Bulletin of miscellaneous information, No. 9.
(From the Superintendent.)

British Guiana (Georgetown, Demerara). Report on the Botanic Gardens and their work for the year 1896-7. (From the Superintendent.)

Jamaica. Bulletin of the Botanical Department of Jamaica, 1898. (From the Director.)

Trinidad. Royal Botanic Gardens—
Annual Report for the year 1897.
Bulletin of miscellaneous information, 1898.
(From the Superintendent.)

AUSTRALASIAN SCIENTIFIC SERIALS.

The Australian Journal of Pharmacy for 1898. (From the editor.)

The Pharmaceutical Journal of Australasia. (From the editor.)

The Victorian Naturalist. The Journal and Magazine of the Field Naturalists' Club of Victoria, 1898.

Proceedings of the Royal Society of Victoria, Vol. x (new series), Parts I and II, 1898. (From the Society.)

Proceedings of the Royal Society of Queensland, Vol. xiii. (From the Society.)

MISCELLANEOUS SERIALS.

The Bulletin of Pharmacy, 1898. From Messrs. Parke, Davis, & Co., Detroit, U.S.A.

Victorian Silk-growing Association, Melbourne. The Cocoon. (From the Association.)

Quarterly record of the Royal Botanic Society of London, January-March, 1898. (From the Society.)

The Journal of the Royal Horticultural Society, London, Vol. xxi, Part III, 1898, Vol. xxii, Parts I and II, 1898. (From the Society).

The Indian Forester for 1898. (From the Director of the Forest School, Dehra Dun, N.W.P., India.)

PUBLICATIONS OF COLONIAL AGRICULTURAL DEPARTMENTS.

New South Wales.

Department of Mines and Agriculture.
1. Report on Agriculture to 31st December, 1897.
2. The Agricultural Gazette of New South Wales.
(From the Department.)

Victoria.

Department of Agriculture.
Guides to Growers.
(From the Department.)

Queensland.

Department of Agriculture.
1. Annual Report of the Department of Agriculture for the year 1897-8.
2. Queeensland Agricultural Journal, 1898.
(From the Department.)

Queensland Colonial Botanist (F. M. Bailey), Brisbane:—
Contributions to the Flora of Queensland, Vol. ii, Parts I to V. (From the author.)

Notes on some Queensland Orchids (By J. F. Bailey). Being a paper read before the Horticultural Society of Queensland. (From the author.)

South Australia.

Bureau of Agriculture.
1. The Journal of Agriculture and Industry of South Australia.
2. Report of the Minister of Agriculture for 1897-98.
(From the Agricultural Bureau.)

Western Australia.

Department of Agriculture.
1. The Producers' and Settlers' Record of Western Australia for 1898.
2. Journal of the Bureau of Agriculture, Vol. iv, Nos. 12 to 20.
3. Official Report of the Sixth Annual Conference of Producers.
(From the Department.)

Conservator of Forests, Perth, W. Australia. Annual Progress Report of the Woods and Forests Department for the year 1897-8. (From the Conservator.)

Cape of Good Hope.

Department of Agriculture.
1. Agricultural Miscellanea, parts 1 to 13.
2. (Pamphlet) Cape of Good Hope as a centre for profitable fruit-growing and for export.
3. Monsonia: The Cape remedy for dysentery.
4. Manual of practical orchard work at the Cape.
5. Reports of Agricultural Assistants at Cape Town, Grahamstown, and Stellenbosch, 1895.
The Agricultural Journal of the Cape Good Hope for 1898.
Reports of the Conservators of Forests for the year 1897

(From the Department.)

Report of the Government Botanist and Curator of the Cape Government Herbarium for 1897. (From the Government Botanist.)

UNITED STATES DEPARTMENT OF AGRICULTURE.

Publications of the Division of Botany as follows :—

Circular No.—
1. Hungarian brome grass.
2. Nut grass.
3. The Russian thistle. (Revised edition.)
5. Giant knotweed or sachaline.
6. Standards of the purity and vitality of agricultural seeds.
7. Tumbling mustard. (Second edition.)
8. Crimson clover hair balls.
9. Wild garlic (Allium vineale, L.)
10. Three new weeds of the mustard family.
11. The vitality of seed treated with carbon bisulphide.
12. The camphor tree (Cinnamomum camphora, Nees and Eberm.). (Revised.)
13. Observations of recent cases of mushroom poisoning in the district of Columbia.
14. Dodders infesting clover and alfalfa.
15. Horse-radish.

Bulletin No.—
16. American ginseng: its commercial history, protection, and cultivation. (By G. V. Nash.)
20. Principal poisonous plants of the United States. (By V. K. Chesnut.)

Contributions from the U.S. National Herbarium, Vol. iii, No. 7, issued 1st April, 1896. (By J. M. Coulter.)

Division of Agrostology, as follows :—

Circular No.—
1. A note on experimental grass gardens.
2. Hairy vetch, sand vetch, or Russian vetch (Vicia villosa).
3. Saltbushes.
4. The renewing of worn-out native prairie pastures.
5. Cowpeas. (Revised edition.)
6. The Cultivated Vetches. (Revised edition.)

Grass gardens. (Reprint from Year Book, U.S. Department of Agriculture, 1895. (By F. Lamson-Scribner.)

Bulletin :—
No. 1. Notes on grasses and forage plants of the South Eastern States. (By Thomas H. Kearney.)
5. A report upon the grasses and forage plants of the Rocky Mountain Region. (By P. A. Rydberg and C. L. Shear.)
6. Grasses and forage plants of the Dakotas. (By Thomas A. Williams.)
8. Studies on American Grasses :—
   (1.) New or little known grasses. (By F. Lamson-Scribner.)
   (2.) Leaf structure of *Jouvea* and *Eragrostis obtusiflora*. (By Miss E. L. Smith.)
9. Notes on grasses and forage plants of Iowa, Nebraska, and Colorado. (By L. H. Pammel.)

Forage conditions of the Prairie Regions. Reprint from Year-book of U. S. Department of Agriculture, 1895. (By Jared. G. Smith.)

Timothy in the Prairie Region. Reprint from the Year-book of U. S. Department of Agriculture, 1896. (By Thomas A. Williams.)

Publications of the Division of Vegetable Phytology and Pathology, as follows :—

Hybrids and their utilization in plant breeding. Reprint from Year-book of U. S. Department of Agriculture, 1897. (By Walter T. Swingle and H. J. Webber.)

Bulletin No. :—
1. Additional evidence of the communicability of peach yellow and peach rosette. (By Edwin F. Smith, 1891.)
2. The California vine disease. A preliminary report of investigation. (By Newton B. Pierce, 1892.)
3. Report of the experiments made in the treatment of plant diseases. (By B. T. Galloway, 1893.)
4. Experiments with fertilizers for the prevention and cure of peach yellows, 1891-92. (By Erwin F. Smith.)
5. The pollination of pear flowers. (By Merton B. Waite, 1895.)
15. Some edible and poisonous fungi. (By Dr. W. G. Farlow.)

Publications of the Division of Fibre Investigations, as follows :—

Report No. 8.—A report on the culture of hemp and jute in the United States, with statements concerning the practice in foreign countries, the preparation of the fibre for market, and remarks on the machine question. (By C. R. Dodge, 1896.)

Bulletin No. 10. Report on flax culture for seed and fibre in Europe and America. (By C. R. Dodge.) 1898.

Special Report on the Beet Industry in the United States. 1898.

Publications of the Division of Forestry, as follows :—

Circular No.—
10. Suggestions to the Lumbermen of the United States in behalf of more rational forest management.
11. Facts and figures regarding our forest resources, briefly stated.
12. Southern Pine—Mechanical and physical properties.
13. Forest-fire Legislation in the United States.
14. Is protection against forest fires practicable?
15. Summary of mechanical tests on thirty-two species of American woods.
16. Age of trees and time of blazing determined by annual rings.
17. Recent Legislation on State Forestry Commissions and Forest Reserves. (Revised edition.)
18. Progress in timber physics. (Influence in size, &c.)
19. Progress in timber physics. (Bald Cypress.)
20. Increasing the durability of timbers.
21. Practical assistance to farmers, lumbermen, and others in handling forest lands.

Bulletin No. 13 (Revised edition)—The timber pines of the Southern United States. By Charles Mohr; together with a discussion of the structure of their wood. (By Filibert Roth.)

Publications of the Division of Pomology, as follows :—

Circular No.—
1. Nut culture.
2. Prune culture in the Pacific North West. (Revised).
3. Notes on peach culture. (Revised.) Reprinted from Report of the Pomologist for 1894.

Report of the Pomologist for 1895. (By S. B. Heighes.)

Nut culture in the United States, embracing native and introduced species, 1896.

Bulletin No. 5—Fig culture. Edible figs: their culture and curing. (By Gustav Eisen.)

Fig culture in the Gulf States. (By Frank S. Earle.)

Publications of the Division of Publications, as follows:—

Bulletin No. 4.—Index to authors, with titles of their publications appearing in the documents of the U.S. Department of Agriculture, 1841 to 1897. (By G. F. Thompson.) 1898.

Office of Experiment Stations:—

Miscellaneous Bulletin No. 1—Proceedings of the second Annual Convention of the Association of American Agricultural Colleges and Experiment Stations, held at Knoxville, Tenn., 1st, 2nd, and 3rd January, 1889.

Experiment Station Bulletin No. 7—Proceedings of the Fifth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations, held at Washington, D.C., 12th to 18th August, 1891.

Experiment Station Bulletin No. 11—A Compilation of Analyses of American Feeding Stuffs. (By E. H. Jenkins and A. L. Winton.)

Bulletin No. 16—Proceedings of the Sixth Annual Convention of the Association of American Agricultural Colleges and Experiment Stations, held at New Orleans, Louisiana, 9th to 15th November, 1892.

Bulletin No. 33.

Experiment Station Record—Vol. 5, Nos. i, xi, and xii; Vol. 7, Nos. xi and xii; Vol. 8, Nos. i to xii; Vol. 9, Nos. i to xi.

Album of Agricultural Graphics.—Value per acre of crops of the United States, based on results of official statistical investigation. (By J. R. Dodge, Statistician.) 1891.

Publications of the Division of Soils as follows :—

Some interesting soil problems. (By Milton Whitney.) Reprint from the Year-book of Department of Agriculture. 1897.

Bulletin No. 11. Tobacco soils of the United States: A preliminary report upon the soils of the principal tobacco districts. (By Milton Whitney.)

Farmer's Bulletin :—
No. 6. Tobacco: Instructions for its cultivating and curing. (By J. M. Estes.)
11. The Rape-plant: its history, culture, and uses. (By Thomas Shaw.)
14. Fertilisers for cotton. (By J. M. M'Bryde.)
15. Some destructive potato diseases. What they are, and how to prevent them. (By B. T. Galloway.)
16. Leguminous plants for green manuring and for feeding. (By E. W. Allen.)
17. Peach yellows and peach rosette. (By Erwin F. Smith.)
18. Forage plants for the south. (By S. M. Tracy.)

19. Important insecticides: directions for their preparation and use. (Third revised edition.) (By C. L. Marlatt.)
20. Washed soils: how to prevent and reclaim them.
21. Barnyard manure. (By W. H. Beal.)
22. The feeding of farm animals. (By E. W. Allen.)
23. Foods: nutritive value and cost. (By W. O. Atwater.)
24. Hog cholera and swine plague. (By D. E. Salmon.)
25. Peanuts: culture and uses. (By R. B. Handy.)
26. Sweet potatoes: culture and uses. (By J. F. Duggar.)
27. Flax for seed and fiber in the United States. (By C. R. Dodge.)
28. Weeds: and how to kill them. (By L. H. Dewey.)
29. Souring of milk, and other changes in milk products. (Revision of Bulletin, No. 9.)
30. Grape diseases on the Pacific Coast. (By Newton B. Pierce.)
31. Alfalfa, or lucern. (By Jared. G. Smith.)
32. Silos and silage. (By Charles S. Plumb.)
33. Peach growing for market. (By Erwin F. Smith.)
34. Meats: composition and cooking. (By C. D. Woods.)
35. Potato culture. (By J. F. Duggar.)
36. Cotton seed and its products. (Condensed from original articles by members of the office force and others.)
37. Kaffir corn: characteristics, culture, and uses. (By C. C. Georgeson.)
38. Spraying for fruit diseases. (By B. T. Galloway.)
39. Onion culture. (By R. L. Watts.)
40. Farm drainage. (By C. G. Elliott.)
41. Fowls: care and feeding. (By G. C. Watson.)
42. Facts about milk. (By R. A. Pearson.)
43. Sewage disposal on the farm, and the protection of drinking water. (By Theobald Smith.)
44. Commercial fertilizers: composition and use. (By E. R. Voorhees.)
45. Some insects injurious to stored grain. (By F. H. Chittenden.)
46. Irrigation in humid climates. (By F. H. King.)
47. Insects affecting the cotton plant. (By L. O. Howard.)
48. The manuring of cotton. (Condensed from an article by H. C. White in Bulletin No. 33 of the office of Experiment Stations.)
49. Sheep-feeding. (By John A. Craig.)
50. Sorghum as a forage crop. (By T. A. Williams.)
51. Standard varieties of chickens. (By G. E. Howard.)
52. The sugar beet: culture, seed development, manufacture, and statistics. (By H. W. Wiley.)
53. How to grow mushrooms. (By William Falconer.)
56. Experiment station work. i. (Prepared in the office of Experiment stations.)
57. Butter-making on the farm. (By C. P. Goodrich.)
58. (1) The soy bean as a forage crop. (By T. A. Williams.)
    (2) Soy beans as food for man. (By C. F. Langworthy.)
59. Bee keeping. (By Frank Benton.)
60. Methods of curing tobacco. (By Milton Whitney.)
61. Asparagus culture. (By R. B. Handy.)
62. Marketing farm produce. (By G. G. Hill.)
63. Care of milk on the farm. (By R. A. Pearson.)
64. Ducks and geese: standard breeds and management. (By George E. Howard.)
65. Experiment Station work. ii.
66. Meadows and pastures: formation and cultivation in the middle Eastern States. (By Jared G. Smith.)
67. Forestry for farmers. (By B. E. Fernow.)
68. The black rot of cabbage. (By Erwin F. Smith.)
72. Cattle ranges of the south-west. A history of the exhaustion of the pasturage and suggestions for its restoration. (By H. L. Bentley.)
75. The grain smuts: how they are caused, and how to prevent them. (By Walter T. Swingle.)

Year-book of the Department of Agriculture for 1895.

Bulletins of American Agricultural Experiment Stations.

Alabama (Canebrake).

Bulletin, No. 18. Cotton, corn, wheat, and forage crops.
Twelfth Annual Report, 1897.

Alabama (Auburn).

Bulletin No. 8. A preliminary list of Alabama fungi.

Botanical Exchange List of the Alabama Biological Survey.

Arizona (Tucson).

Bulletin No. 3. Irrigation in Arizona.
4. Waters and water analysis.
6. Soils and waters.
7. Canaigre.
9. Insects and insecticides.
10. Experimental work at Willcox.
12. Preliminary report of observations on the Crown knot.
20. Arizona weather.
23. Sugar beets.
27. Arizona weather and climate.
28. Salt River Valley soils.

California (Berkeley).

Bulletin No. 104. Investigation of Californian olives and olive oil.
105. (1) The Canaigre, or Tanners' Dock.
    (2) Australian saltbushes for alkali soils.
106. Distribution of seeds and plants.
107. The Russian thistle in California.
108. The distribution of salts in alkali soils.
109. Distribution of seeds and plants.
110. The study of human foods and practical dietetics.
111. The work of the College of Agriculture and experiment stations.
112. Distribution of seeds and plants.
113. Suggestions for the use of disinfectants.
114. Sowing Australian saltbushes.
115. Directions for taking soil samples.
116. The Californian vine hopper.
117. The control of temperature in wine fermentation.
118. Distribution of seeds and plants.
119. Vine pruning.
120. The olive knot.
121. The conservation of soil moisture and economy in the use of irrigation water.

Report on grasses and forage plants. (Reprint from reports for the years 1895, 1896, and 1897.)
The beet sugar industry and its development in California. (Reprint from Pacific Rural Press.)

Carolina North (Raleigh).

Report on Raleigh Agricultural Experiment Station for the year 1897–8.

Connecticut (New Haven).

Twenty-first annual report.

Idaho (Moscow).

Bulletin No. 1. Organisation and progress of work.
2. Announcement and proposed work.
3. The application of chemistry to the agricultural development of Idaho.
4. (1) Methods of preventing smut in wheat and oats.
    (2) Carbon bisulphide as a squirrel exterminator.
    (3) A new squirrel exterminator.
6. Annual Report for 1894.
7. Insecticides and spraying.
8. Water and water analyses.
9. (1) Idaho soils.
    (2) Miscellaneous analyses.
11. Smuts and rusts of grains in Idaho.
12. Sugar beets in Idaho.
13. Meteorology.
14. Twelve of Idaho's worst weeds.
15. Report for the years 1897–8.

Annual Report for the years 1894–5.

Iowa (Ames).

Bulletin No. 1. Organization and plans.
2. (1) Corn tassels, silks, and blades.
    (2) Proposed chemical work.
    (3) Grasses and other forage plants.
    (4) Chinch bug remedies.
    (5) Arsenic experiments.
    (6) Promising new cherries.
3. Characteristics of hardy and tender fruit trees.
4. (1) Notes on some introduced plants of Iowa.
    (2) A study of leaf anatomy of some species of genus *Bromus*.
    (3) A comparative study of the leaves of *Lolium* and *Bromus*.
    (4) An anomatical study of the leaves of some species of the genus *Andropogon*.
6. Experiment station wheat and oats in 1889.
7. Experiments with corn.
8. Iowa station milk test.
9. Comparative value of fodder plants.
10. Our rusted and blighted oats and barley in 1890.
11. Experiments in making and storing hay.
12. Experiments with potatoes.
13. Experiments in feeding for milk.
14. Effect of food upon the quality of milk.
15. Sugar beet growing.
16. Flax seed meal and oil meal.
17. Feeding beets and potatoes for butter.
18. Experiments with sheep.
20. Steer feeding.
21. Investigation in cheese-making.
22. A study in churning.
23. Soiling.
24. Steer and heifer beef.
26. The Russian thistle.
27. Soiling crops in 1894.
28. Angus and short-horn feeding experiment, &c.
29. Investigation of bovine tuberculosis.
30. Treatment of currants and cherries to prevent spot diseases.
32. Entomological work for 1895.
35. Lamb feeding.
36. Soil moisture.

37. Sugar beet investigations.
38. The Russian thistle.
39. Weeds.

Contributions from the Botanical Department, No. 9. Alfalfa leaf spot disease.

Seed testing.

Kansas (Manhattan).

Bulletin No. 7. Experiments with wheat.
8. Preliminary reports on smuts on Oats.
10. Notes on conifers.
11. Experiments with wheat.
12. Preliminary experiments with fungicides for stinking smuts of wheat.
13. Experiments with oats.
14. Winter protection of peach trees, and notes on grapes.
15. Additional experiments and observations.
16. Experiments with sorghum and sugar beets.
17. Crossed varieties of corn, second and third years.
18. Experiments with forage plants.
19. Germination of weeviled peas.
71. Experiments with wheat.
72. Growth of young stock.
73. Fruit trees.
74. Experiments with oats.
75. Root development.
76. Fifth report on Kansas weeds. Vegetative propagation of perennial weeds.
77. Some insects injurious to the orchard.
78. Sugar beets.

Kentucky (Lexington.)

Bulletin No. 2. Corn fodder and food for stock.
32. Strawberries and vegetables.
33. Corn experiments.
34. Commercial fertilizers.
35. Experiments with wheat and oats.
37. Experiments with potatoes.
38. Vegetables, Strawberries.
39. Mares.
40. Some common pests of the farm and garden.
41. Commercial fertilizers.
42. Experiments with wheat and oats.
43. Commercial fertilizers.
44. Bordeaux mixture for apple pests.
45. Field experiments with fertilizers.
46. Commercial fertilizers.
47. The pests of shade and ornamental trees.
49. Destructive locusts in Kentucky.
50. Fruit growing in Kentucky.
51. Commercial fertilizers.
52. Commercial fertilizers.
53. Spraying for Codlin moth.
54. Notes on vegetables.
55. Field experiments with fertilizers.
56. Analysis of commercial fertilizers.
57. Wheat experiments.
58. Cutworms in Kentucky.
59. Spraying experiments in 1895.
60. Analysis of commercial fertilizers.
61. Potatoes.
62. Strawberries.
63. Tobacco.
64. Analysis of commercial fertilizers.
69. Wheat.
70. The woolly mullein.
71. Official analysis.
72. Potatoes.
73. Strawberries.
74. (1.) The Chinch bug.
(2.) Earthworms, a source of gapes in poultry.
75. Commercial fertilizers.
76. Commercial fertilizers.
77. Wheat.

Maine (Orono.)

Thirteenth Annual Report, 1897.

Minnesota (St. Anthony's Park.)

Bulletin No. 36. Miscellaneous analyses of feeding stuffs.
37. The Chinch bug.
38. Garden tillage and implements.
39. Potatoes.
40. Grain and forage crops.
41. Soils.
42. The composition, digestibility, and food values of potatoes.
43. Insects injurious in 1895.
44. Fattening steers and lambs in winter.
45. Potatoes.
46. (1) Forage and grain crops.
(2) Cross rotation experiments.
(3) Smut in wheat.
(4) Three annual weeds.
(5) Tillage experiments.
(6) Meteorological records.
47. Flax.
49. Rate of increase on the cut-over timber lands of Minnesota.
50. Progress at several experiment farms in 1896.
56. Sugar beet.
57. Fattening lambs in winter.
58. Fattening steers in winter.
52. Fattening lambs and wethers in winter.
60. Beef-cattle and swine.

Macmillan, Conway. Minnesota botanical studies :—

Bulletin No. 9, part 1, 1894.

Bulletin No. 9, title page, and table of contents; also index for series i.

Series ii, part i, June, 1898. (From the author.)

Missouri (Columbia.)

Bulletin No. 38. Peach-growing.
39. The influence of width of tire on draft wagon.
40. The sugar beet.
41. The San Jose scale in Missouri.
42. A new orchard pest. The fringed-wing apple-bud moth.
43. (1) Winter forcing of asparagus in the open field.
(2) Asparagus culture in Missouri.

Nebraska (Lincoln).

Bulletin No. 50. Notes on pruning.
51. Observations on the Codlin moth.
52. Cornstalk disease.
53. A preliminary report on experiments with forage crops.
54. The effects of certain methods of soil treatment upon corn crops.

Eleventh Annual Report.

New Hampshire (Durham).

Bulletin No. 40. Strawberries.
46. An experiment with steam-drill and methods of road maintenance.
48. Ninth Annual Report.
49. The inspection of fertilizers.
50. Dehorning cattle.
51. Sweet corn for New Hampshire.
52. Growing musk melons in the north.

Catalogue of the New Hampshire College for 1897–8.

Nevada (Reno).

Bulletin No. 1. History of organization and proposed work of the station.
2. The investigation of the independence of plant life.
3. Meteorological Report for 1898.
4. Meteorological Report for January, February, and March, 1889.
5. Meteorological Report for April, May, and June, 1889.
6. Meteorological Report for July, August, and September, 1889.
8. The codlin moth.
10. The pear and cherry slug.
11. Plant life infesting the apple.
14. Potato experiments.
15. Dodder.
16. The Creamery Industry.
17. The woolly aphis of the apple.
18. Cheese and its manufacture.
19. Sugar beets.
20. (1) Potatoes. (2.) Tobacco.
21. Nevada weeds.
22. Nevada weeds.
23. Sugar weeds.
24. Early Flora of the Tucker Valley.
25. Irrigation.
26. Feeding stuffs.
27. (1) Grain. (2) Potatoes.
28. An important elm scale.
29. The San Jose scale.
30. Wheat cutting at different dates.
31. Texas cattle fever.
32. Sugar beets.
33. Field notes on some Nevada grasses.
34. Drinking water.
35. Hops.
36. Some injurious insects of W. Nevada.
37. Sugar beets. Notes for 1897.

New York (Cornell University).

Bulletin No. 39. Creamery and ærating milk.
40. Removing tassels from corn.
41. On the comparative methods of steam and hot water for greenhouse heating.
49. Sundry investigations for the year 1897.
53. Œdema of the tomato.
55. Greenhouse notes for 1892–3.
58. The four-lined leaf-bug.
61. Investigations of the year 1893.
64. On certain grass-eating insects.
69. Hints on the planting of orchards.
71. Apricot growing.
72. The cultivation of orchards.
73. Leaf curc and plum pockets.

74. Impressions of the peach industry in Western New York.
75. Peach yellows.
76. Some grape troubles of Western New York.
77. The grafting of grapes.
78. The cabbage root maggot.
79. Varieties and leaf blight of the strawberry.
80. The quince in Western New York.
81. Black-knot of plums and cherries and methods of treatment.
82. Experiments of tuberculin on non-tuberculous cows.
83. A plum scale in Western New York.
84. The recent apple failures of Western New York.
85. Whey butter.
87. The dwarf Lima beans.
92. On the effect of feeding fat to cows.
93. The cigar-case bearer in Western New York.
95. Winter musk-melons.
96. Forcing house miscellanies.
97. Studies in artificial cultures of entomogeneous fungi.
98. Cherries.
100. Evaporated raspberries in Western New York.
101. Notions about the spraying of trees, with remarks on the canker worm.
102. General observations respecting care of fruit trees, with some reflections upon weeds.
103. Soil depletion in respect to the care of fruit trees.
104. Climbing cut worms.
105. Tests of cream separators.
106. Revised opinions of the Japanese plum.
107. Wire worms and the bud moth.
136. Chrysanthemums.
137. Agricultural extension work.
138. Mushrooms.
139. Japanese plums.
140. Second report on potato culture.
141. Powdered soap as a cause of death among swill-fed pigs.
142. The codlin moth.
143. Sugar-beet investigations.
144. Notes on spraying.
145. Some important pear diseases.
146. Fourth report on progress of extension work.

Ohio (Wooster).

Bulletin No. 67. Oats.
68. Some destructive insects.
69. The Chinch bug.
70. Forage crops.
71. The maintenance of fertility.
72. Peach yellows, black-knot, and San Jose scale.
73. Investigations of plant diseases.
74. Fifth Annual Report.
75. Beet sugar production.
76. Potatoes.
77. The Chinch bug and other destructive insects.
78. Corn.
79. Some diseases of orchard and garden fruits.
80. The maintenance of fertility.
81. The San Jose scale in Ohio.
82. Field experiments with wheat.
83. A first Ohio Manual.
84. Seventh Annual Report.
85. Strawberries.
86. History of the lives of a butterfly and moth.
87. The periodical Cicada.
88. Co-operative experiments made by the Ohio Agricultural Students' Union.
89. Prevalent diseases of cucumbers, melons, and tomatoes.
90. Sugar beet investigations.
91. The lung and stomach worms of sheep.
92. Preliminary report upon the diseases of the Peach.
93. The home mixing of fertilisers.
94. The maintenance of fertility.

Pennsylvania (Centre County).

Bulletin No. 9. Digestibility of corn fodder and silage.
16. Culture of the chestnut for fruit.
17. The value of cotton-seed meal as compared with bean for the production of butter.
18. Notes on new and old varieties of orchard fruits and small fruits.
20. Tests of dairy apparatus.
21. The Koch test for tuberculosis.
22. Tests of dairy apparatus.
23. Forest fires.
24. Influence of quantity of food upon economy of milk and butter production.
25. Small fruits in 1893.
26. Mangels and sugar beets versus silage yield—cost and feeding value.
27. Tests of cream separators.
28. Cotton-seed feed for dairy cows.
29. Tuberculosis of cattle.
30. Tobacco experiments.
31. Report of the Director for 1894.
32. Small fruits in 1894.
33. Directions for using the Babcock milk test.
34. A phosphate deposit in Juniata County.
35. A soil test with fertilisers.
36. Chestnut culture for fruits.
39. Wheat, oats, and potatoes.
40. The sugar beet in Pennsylvania.
41. Tests of dairy feeds.
43. Apples in Pennsylvania.

Texas (College Station).

Bulletin No. 42. The Irish potato.
43. Report from Beeville Station.
44. Paints and painting materials.
46. Grasses and forage plants.

Vermont (Burlington).

Bulletin No. 49. Potato blights and fungicides.
54. Salad plants and plant salads.
55. Apple growing in Grand Isle County.
60. Insects of the year.
61. Hardy apples of cold climates.
62. Home-grown grapes in Vermont.
63. Analyses of commercial fertilisers.
64. do do
65. do do

Virginia West (Morgantown).

Bulletin No. 1. Organisation work for 1890.
4. The creamery industry.
5. The selection of milch cows.
6. Milk.
7. Experiments upon wheat.
8. Meteorological observations,
9. Additional reports upon wheat distribution in 1889.
10. Meteorological reports for August.
11. Meteorological reports for September.
12. The Canadian thistle.
13. The creamery industry.
14. Farm and garden insects.
15. Raspberry gouty-gall beetle.
16. Yellow locust.
17. Black spruce.
18. Law and regulations concerning the sale of commercial fertilizers in the State of West Virginia.
19. Weeds as fertilizers.
20. Potato culture and fertilization.
21. Injurious insects and plant diseases.
22. Your weeds and your neighbours'.
25. Plat experiments with commercial fertilizers on wheat.
26. Law and regulations concerning the sale of commercial fertilizers in the State of West Virginia.
27. Plat experiments with commercial fertilizers on corn.
29. Experiments on corn and potatoes.
30. Notes on sheep.
31. Catalogue of West Virginia Scolytidæ and their enemies.
32. Catalogue of West Virginia forest and shade tree insects.
33. Sub-irrigation in the greenhouse.
34. Fertilizer analyses for the year 1893.
35. Defects in wood caused by insects.
36. Black holes in wood.
37. Electro-horticulture.
38. Potato blight and scab.
39. Vegetables.
40. Commercial fertilizers.
41. Potatoes.
42. Vegetables.
43. Why, when, what, and how to spray.
44. Practical entomology.
45. Chickens.
50. The practical cicada in West Virginia.
51. Commercial fertilizers.
52. Strawberries.

Canada.

Ottawa Central Experimental Farm.

Bulletin No. 27. Strawberries.
28. Weeds.
29. Results obtained in 1897 from trial plots of grain, fodder, corn, and roots.

Report of the Entomologist and Botanist for 1896.

Evidence of Dr. James Fletcher before a select committee of the House of Commons on agriculture and colonization, 1897.

Report of the Director for 1897.

Papers on horticulture and kindred subjects, 1891 (by William Saunders, Director).

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Aviary.

Presented to the Trustees National Park—1 bustard or plains turkey (*Eupodotis australis*, Gray, Australia.)

PRESENTATIONS.

1 morepork (*Podargus strigoides*, Lath., Australia. From Miss A. Brownlow, 8 Shepherd-street, Darlington.

3 stone curlews or stone plovers (*Œdicnemus grallarius*, Lath., Australia). From Mr. W. A. B. Greaves, "St. Helens," Burwood.

1 galah parrot (*Cacatua roseicapella*, Viellott, Australia). From Miss Hill, 43 Bent-street, Sydney.

2 Pennant's parrakeets (*Platycercus elegans*, Gmelin, Queensland.

5 bronze-wing pigeons (*Phaps chaloptera*, Latham, Australia).

1 Port Lincoln parrot or banded parrakeet (*Platycercus zonarius*, Shaw, Central and South Australia).

2 Californian quail (*Callipepla californica*, Shaw and Nodder, California).

5 dotterel quail (*Turnix varia*, Lath., Australia).

1 rosella (*Platycercus eximus*, Shaw, New South Wales). From Miss Lily Hill, Vaucluse.

2 sulphur-crested cockatoos (*Cacatua gymnopis*, Sclater, North and North West Australia).

1 golden pheasant cock (*Chrysolophus pictus*, Linn., China).

1 Reeves' pheasant cock (*Phasianus Reevesi*, Gray, China.) From Mr. W. Parr, 13 Broadway, Glebe.

5 white-backed magpies (*Gymnorhina tibicen*, New South Wales.) From Mr. A. M. N. Rose, Boloa, Buckley's Crossing.

1 sulphur-crested cockatoo and cage (*Cacatua gymnopis*, Sclater, North and North-west Australia.) From Miss Spencer, Criterion Theatre, Sydney.

1 blackbird (*Merula merula*, Linn., Europe). From Mr. S. W. Wagstaff, 145, Alfred-street, North Sydney.

PURCHASED.

2 Brown's parrakeets (*Platycercus Browni*, Temm., Port Darwin).

BRED IN THE AVIARY.

6 hybrid pheasants—English x silver.

CAUGHT BY AVIARY-KEEPER.

1 Pennant's parrakeet (*Platycercus elegans*, Gmelin, Queensland).

STOLEN OUT OF CAGE.

1 golden pheasant cock (*Chrysolophus pictus*, Linn., China).

DEATHS.

3 Java sparrows (*Munia orizivora*, Linn., Java).
3 common pheasant hens (*Phasianus colchicus*, Linn., China).
1 silver pheasant hen (*Gennæus nycthemerus*, Linn., China).
1 crane.
1 white swan, killed by dogs (*Cygnus olor*, Linn., Europe).
1 Egyptian quail.
1 dotterel quail (*Turnix varia*, Lath., Australia).
1 brush turkey (*Calethurus Lathami*, Gray, Queensland).
1 horned parrakeet (*Nymphicus cornutus*, Gmelin, New Caledonia).
3 galah parrots *Cacatua roseicapella*, Veillott, Australia).
1 warbling grass parrakeet (*Melopsittacus undulatus*, Shaw, Australia).
3 red-billed liothrix (*Liothrix lutea*, Scop., Asia).
2 chestnut-eared finches (*Tænopygia castanotes*, Gould, Australia).
4 wood ducks, killed by cats (*Chenonata jubata*, Lath., Australia).
1 wood pigeon.
7 magpies (*Gymnorhina tibicen*, N. S. Wales).
1 pale-headed parrakeet, killed by rats (*Platycercus pallidiceps*, Vigors, Queensland).
1 cut-throat finch (*Amadina fasciata*, Gmelin, South Africa).
1 long-billed cockatoo (*Liometes nasicus*, Lath., N. and N.E. Australia).
2 bronze-wing pigeons (*Phaps chaloptera*, Lath., Australia and Tasmania).
1 weaver (*Quelea quelea*, Linn., S. Africa).
1 morepork (*Podargus strigoides*, Lath., Australia).

Government Domains.

Introductory.—No votes of money having been granted for new works, any special undertaking had to be provided for from savings. I trust, however, that the year will be found to have been one of real progress in the work of the Domains.

On the 12th and 13th February, after five weeks' severe drought, we were visited by a heavy downpour of rain (4½ inches in forty-eight hours), accompanied by almost a hurricane wind of 70 miles an hour, which uprooted several trees and tore great branches from others, necessitating the employment of the staff for several days pruning, &c., and cleaning up fallen débris. On 5th and 6th of May we had a similar storm, the wind blowing 67 miles an hour, and 6 inches of rain fell in the two days. This storm will be remembered as that which caused the wreck of the "Maitland," off Broken Bay. Again, on 30th June, and 2nd October, we had severe storms; 2¾ inches of rain fell on the latter date. All these storms inflicted damage on the Domain.

Carriage Roads.—During the year 2,500 square yards of carriage-way, in various places, have been torn up and re-metalled with 190 tons of good hard blue stone, hand-broken to 2-inch gauge. This has been lightly covered with good binding clay, thoroughly saturated with water, and well rolled. The road

was

was at once made available again for vehicular traffic. A portion—800 square yards—of the semi-circular terminal carriage-way, near Mrs. Macquarie's Chair, has been laid with rough asphalt. This is a resting-place for vehicular traffic, and from it may be obtained a magnificent view of the Harbour and passing vessels, besides which several men-'o-war generally repose in the vicinity.

During the long spells of dry weather which were experienced during the year, it was found necessary to keep the watering-cart frequently in use on the carriage-roads, in order to bind the loose metal, and preserve a regular and smooth surface.

I am still very anxious about the steepness of the road where that from St. Mary's Gate to Mrs. Macquarie's Chair intersects that from the Macquarie-street gate to Palmer-street gate. Minor accidents at this place are of constant occurrence, and although reduction of the grade at this particular spot will be both difficult and expensive, I trust that, out of consideration for both man and beast, the work will be taken in hand at an early date.

Footpaths.—A new footpath (68 feet long by 4½ feet wide) has been made joining the carriage-way at Mrs. Macquarie's Point, with another at a lower level overlooking Farm Cove at its south-eastern side. This proves a convenience to persons in wet weather, or on a dewy morning, as hitherto those pedestrians who wished to pass to the foot-path from the carriage road, or *vice versâ*, had to cross the turf.

Dilapidated foot-paths and surface-water channels have been broken up, tarred, and re-asphalted, to the extent of 1,206 square yards, while 4,680 square yards of asphalt walks have been painted over with boiling tar, and immediately sanded.

Besides the maintenance and routine work connected with the paths, the three following important improvements have been commenced:—

(1.) The main central avenue for pedestrian traffic leading from St. Mary's entrance gates to the Botanic Gardens gates, over 420 yards in length, is in the most frequented portion of the Outer Domain, and was found to be much too narrow for the large numbers of people using it on Sundays and holidays. The sides were broken and undefined, and the width of the avenue varied from 17 to 20 feet. The sides have been properly aligned to a uniform width of 24 feet, and neatly kerbed with 3-inch round-topped freestone from the Pyrmont quarries. The extra width of the walk enclosed was ballasted with stone debris from buildings in progress at a trifling cost. The whole of this beautiful avenue now requires re-asphalting, which it is to be hoped will be carried out at an early date.

(2) Beach-walk.—From its first formation, some eighteen or twenty years ago, this favourite marine parade has been a source of trouble on account of sudden and irregular subsidences causing dangerous holes on the surface. This arose from fine silt and gravel having been used amongst large stones in the original formation; this has gradually been washed away by the tidal waters percolating through the imperfect base of the dwarf sea-wall, and undermining the whole of the walk.

An opportunity occurred towards the end of the year of giving temporary work to a number of men. The whole of the west side was turned over 2 to 3 feet deep, all the large stones broken up and rammed close together, thus filling up all cavities; the shrinkage thus created on the surface was made good by the addition of over 300 cart-loads of stone debris and clay, &c. The walk now requires a top-dressing of good gravel to make it perfect.

(3.) New Steps.—A beginning has been made of another important improvement between Mrs. Macquarie's Chair and the Corporation Baths, on the steep escarpment facing Garden Island. On account of its inaccessibility it has hitherto been mostly given up to loafers. There was no easy access from the high-level walk on east side to the promontory to the Beach-walk, some 40 feet below, without a very circuitous journey. A flight of zig-zag stone and concrete steps has been commenced to unite these walks, and it is proposed to further improve upon the already-interesting natural features of the place by utilising projecting portions as seats, landings, or platforms, or as canopies over recesses forming open caves, and cosy look-outs for picknickers and other visitors.

When in the near future the electric light will be shining here during fine evenings, and fresh water laid on to the vicinity, this place will be an excellent rendezvous for respectable citizens. These slopes afford some of the most beautiful scenery in the world, and having an easterly aspect, the afternoon sun will not inconvenience those who desire to use the place for a quiet read or simple rest. So strongly do I feel in regard to the desirability of utilising these slopes, that I look forward to the time when I shall be in a position to construct three or four rustic flights of steps to connect these high-level walks with the Beach-walk. I am very anxious, also, to connect the high-level walk overlooking Farm Cove with the Beach-walk. I do not doubt that it is mere oversight that has prevented the utilisation of these beautiful slopes so long, and it speaks volumes for the good nature of our citizens that, for so long a period, they have been content with making a tedious detour whenever they desired to pass from the high-level roads and paths in the Domain to the Beach-walk, and *vice versâ*.

Removal of old trees.—It has been found necessary to remove the following old trees which, through disease, old age, or breakage by storms, had become unsightly and useless:—3 White or Cabbage Gum (*Eucalyptus hæmastoma*, var. *micrantha*); 3 Brush Box (*Tristania conferta*); 1 Moreton Bay Fig (*Ficus macrophylla*); 1 Blue-berry Ash (*Elæocarpus cyaneus*); 3 Forest Red-gum (*Eucalyptus tereticornis*); 2 New Zealand Karaka (*Corynocarpus lævigatus*); 1 Port Jackson Fig (*Ficus rubiginosa* or *australis*); 1 White Poplar (*Populus alba*).

The *E. hæmastoma* and *E. tereticornis* were not planted by the hands of man. Some of these trees have been unsightly for years, and if I could have spared the labour I would have made a clean sweep of them before. While a healthy tree is one of the most beautiful objects in Nature, a diseased and dying one is a lamentable sight, offensive to the eye, liable to communicate disease to healthy trees, and a possible source of danger to pedestrians in its enfeebled condition.

In addition to the above, 2 Norfolk Island Pines (*Araucaria excelsa*), 6 Aleppo Pines (*Pinus halepensis*), 3 Smooth-barked Apple (*Angophora lanceolata*), 3 *Banksia integrifolia*, 2 *Pinus insignis*, and 2 *Pittosporum undulatum*, have all died from one cause or another.

Tristania, *Corynocarpus*, and *Pittosporum* are subject to grubs in the stems and branches, which cannot well be got at. Most of the *Pinus halepense* in the Domain have been suffering for several years past from the effects of an insect pest very difficult of treatment. The Figs and Poplars have been blown over or broken by fierce winds, and the others have died back gradually from old age, dry-rot, or white ants.

The above list of removals shows the necessity for yearly plantations to keep up the supply, and already several sites for trees have been decided upon, and will be occupied as soon as funds and opportunity will allow.

Much

Much pruning and some thinning-out has been necessary to keep trees in shape and out of harm's way, while a quantity of dead wood has been removed from old gum-trees to preserve their green and healthy appearance as much as possible. Nevertheless, the day is approaching more rapidly than I like, when the self-planted indigenous trees in the Domain will be a thing of the past. Like our aborigines, they pass away with the development of the improvements of civilised men. I may remark that several trees, both figs and pines, which were planted some years ago near the water's edge, for ornament and shade, have succeeded so well that they now interfere considerably with the magnificent view from the carriage-road, and will probably have to be thinned-out in the near future.

Tree-planting during the year.—During the year ending December, 1898, no young trees were planted in the Domain, as all our available funds, after the usual necessary repairs to roads and paths, &c., were expended upon improving the central avenue, as referred to in this Report. It is to be hoped, however, that during the year 1899 we will be able to provide guards for and plant at least two dozen permanent trees in suitable places.

Acacia or Wattle Plantation.—This corner of the Domain, near Governor Bourke's statue, is very interesting. A plantation was begun here in 1897, and already some wattles have shown their flowers. Further ground, in the same locality, is being prepared to increase the collection, which it is hoped will be largely added to during 1899.

Rosarium.—This garden, near St. Mary's entrance to the Domain, has proved very attractive and interesting to visitors. There are now 196 varieties of roses to be seen here, all true to name; and although the place is very much exposed to east and south-east winds, causing the plants to suffer severely, yet numbers of blooms are maintained every month of the year. A lawn-mower is frequently used on the green turf-paths; the encircling walk has been ballasted and covered with fine sandstone chippings, which produces a very good effect. Edging tiles have been laid on one side of this walk all round, and the ground has been partially drained.

Grass.—Hundreds of loads of soil and loamy clay from various foundations and excavations about Sydney have been used in filling hollow places, and in levelling-up the ground. Grass has been planted on bare patches, although on certain spots where there is much traffic or dense shade from the trees there will always be absence of green sward.

Water Supply.—We have still only one fountain in the Domains. Further accommodation in this respect is much needed, particularly at two points, namely, near Mrs. Macquarie's Chair, and towards St. Mary's entrance gates, where visitors mostly congregate on Sundays, &c.

A cattle drinking-trough is also much required near Mrs. Macquarie's Chair, but at present the water-main does not extend to within several hundred feet of the spot.

Following is the registered water-supply during the year:—

Meter No. 284. Enclosure near Macquarie-street entrance, Domain.—May, 1898 (date of fixing), to December, 1898...	1,000	gallons.
Meter No. 285.—Cattle trough, St. Mary's entrance, Domain.—June 10, 1898 (date of fixing) to December, 1898	6,000	„
Meter No. 275.—Enclosure near St. Mary's entrance, Domain.—From January, 1898, to December, 1898	24,000	„
Meter No. 277.—Cattle trough near Cricket Ground.—January, 1898, to December, 1898	16,000	„
Total	47,000	gallons.

Lighting.—An extension of the present system, or a better system, of lighting the Outer Domain is very much required. There are forty-seven feeble gas lamps scattered over an area of 50 acres of ground, and the other 40 acres have no artificial light at all. I can only reiterate the wishes contained in my last Report. If the Domain were well lighted by the electric light, thousands of citizens would promenade it every evening, which at present they are unable to do.

Seats.—There are now 230 seats scattered all over the Outer Domain, making a net addition of thirty during the year, after replacing a number of broken or worn-out ones. Even this number is very inadequate at certain times and in certain places. I hope to still further augment them during the coming year. These seats are all 6 feet long, and can easily accommodate five persons; but two or three persons usually monopolise the whole seat. It is a matter for consideration whether shorter seats and more of them would not better suit the public convenience.

Railings and Fences.—The fences have been kept in repair and the old single batten fences to protect verges and slopes are gradually being replaced with 3 x 3 rails set diagonally and supported by posts of the same dimensions. The iron railing near the electric lighting station at Woolloomooloo Bay having been frequently broken, a gate has been fixed in the railing at this place with the view to meet the public convenience. The boundary between the Domains and Botanic Gardens along Mrs. Macquarie's Road is marked by an unsightly galvanised iron fence. This structure is not only hideous in itself, but it prevents visitors to the Gardens looking out into the Domain, and, above all, it prevents visitors to the Domain from enjoying the delightful view across the Gardens towards Farm Cove. A neat dwarf wall, surmounted by an iron railing, would cost perhaps £1,500, but the improvement to both the Gardens and Domains would be immediate and enormous. The present condition of affairs may be likened to that of a precious jewel in a setting of base metal.

Tree Guards.—The most effectual tree guards for the purposes of the Domain are circular iron guards, 7 feet in diameter and 4 feet 6 inches high, made of round iron pointed at the upper end. Picket-fence guards, 8 feet square and 4 feet 6 inches high, are also useful in certain places, *e.g.*, about Mrs. Macquarie's chair, and on the flat ground near the floating baths, Farm Cove. The iron ones are used in the south-west part of the Domain, and in the central avenue and in other places. The cost of picket-fence guards as above is about £3 each. The cost of circular tree guards as above is about £3 10s. each. The latter are very durable, will probably last three generations of trees, and always look well. The picket-fence guards will probably last only one generation.

Painting.—All seats and fences in the Domains, except the boundary iron railing, receive, if possible, an annual coat of paint; this has been done within the past year. The question of colour is a debatable one. Some people prefer green, as being theoretically the most natural colour, harmonising with everything around. Unfortunately, during our hot summers, trees and grass, &c., are often not green.

green; but even with all vegetation "in verdure clad," it may not follow that inanimate objects in the vicinity, such as fences, railings and seats, should be similarly coloured; also, owing to its lack of durability, green paint soon becomes of a sombre unattractive hue. At present a quiet stone-colour has been selected as seemingly the most appropriate for the Domain, and I have not heard any adverse criticism from the general public, from painters, or from landscape gardeners. It has certainly the merits of durability, and has a bright, clean appearance.

Refuse.—The iron bins provided as depositories for fruit, paper, and other rubbish, have not been much availed of by visitors. By want of thought in this respect, visitors impose an enormous amount of unnecessary labour on the staff, which is the more regrettable seeing the desirable improvements that cannot be carried out simply because workmen are not available for the purpose.

Public Latrines.—These conveniences were erected in 1895, and are now extensively used by the public. The present accommodation is already rather limited, and arrangements are being made for its extension. On one Sunday in January, about 1,700 persons were counted entering these latrines, and the numbers are not decreasing. The latrines require frequent attention to keep them wholesome and clean, and improved arrangements will be adopted with the extension referred to. These latrines are confined to one portion of the Domain, in a convenient, though not in a central situation. In my opinion more latrines for men, in the vicinity of Mrs. Macquarie's Chair, are absolutely necessary. The absence of similar accommodation for females is a matter for very great regret.

Music.—The bandstand was erected in 1897, and was first used by the Permanent Artillery Band on 16th February, 1898, and these performances have proved an immense attraction. Many citizens now look eagerly forward to Wednesday afternoons for the recognised weekly musical performance. At the beginning of the year visitors could be counted by a few hundreds; recently, over 2,000 listeners have been frequently counted at a performance. The stand is not reserved for any particular body of performers; it is only required that applications should arrive in sufficient time to permit of proper arrangements being made. During the year, on Sunday afternoons, several bands belonging to Sydney and suburbs have played sweet music on this bandstand, and I would like to see it occupied far more frequently than is the case at present. The comfortable seating of the public at these performances seems to be out of the question when the audiences are large. The number of seats in the vicinity of the bandstand has been largely increased, but at present the people mostly accommodate themselves on the grass, while in very wet weather the band rarely performs; but if some enterprising individual were to offer to supply seating accommodation—say camp-stools, or light chairs—on these occasions, his venture would probably be remunerative. I would like to see the bandstand lighted with gas or electricity in the near future; in this case, musical evenings in the Domain will become a fashionable enjoyment.

Cricketing and other games.—The juvenile cricket-ground formed last year on the east side of the Lower Domain, adjoining Cowper wharf, has been very much availed of by the persons for whom it was intended, and small boys who practise cricket and other games in other parts of the Domain are not interfered with unless they take up places where their games will cause inconvenience to pedestrians and others using the Domain.

Bathing.—I am far from satisfied with the bathing arrangements in Woolloomooloo Bay and Farm Cove. It seems to me that the requirements of the public should be far better served than they are at present, while improved arrangements would, I feel sure, result in an enormously increased number of bathers. Thus judicious expenditure would result in increased revenue to lessees of baths. By the erection of a hideous fence some 18 feet high the lessee of one of the baths has removed the scandal that formerly existed through visitors to the Domain being able to see, from the road, nude bathers.

Insect pests.—Some two or three years ago a scale insect was discovered to be attacking and considerably injuring several oak-trees. It was determined by the Government Entomologist to be *Psterodaspes* (*Planchonia*) *quercicola*. A few sprayings with kerosene emulsion and resin-wash, however, has hindered its progress, and a few more will probably exterminate it. For green-fly on roses we find Gishurst compound the best remedy—2 oz. to a gallon of hot water. For mildew, sulphur is successfully used. For slugs and snails quicklime is best; and for ants on walks, bisulphide of carbon has been effectively used.

Weeds.—The well-known Nut-grass (*Cyperus rotundus*) is a serious pest in the Domain. It comes with soil, by the agency of birds, and in various ways. Our men have to wage a relentless war upon it. Frequently it appears to get the upper hand, and nothing but intelligently-directed perseverance can cope with it. The eradication of this pest involves us in a serious annual charge.

The other troublesome weeds here are Paddy's Lucerne (*Sida retusa*), Cobblers' Pegs (*Erigeron canadense*), and the grass *Sporobolus indicus*, all of which frequently overgrow the pasture grasses, are not much eaten by cattle, and give the sward an untidy appearance if allowed to spread. *Lantana camara* has been almost entirely exterminated, while *Phytolacca* (Poke-weed), *Datura Stramonium* (Stramonium), *Cryptostemma calendulaceum* (Cape-weed), *Xanthium spinosum* (Bathurst-burr), and *Emex australis* have been nearly exterminated.

Many weeds, and even Nut-grass on gravel paths and sides of carriage roads, have been destroyed by two or three consecutive applications of sodium arsenite. The proportions used are 5 lb. arsenic, and 10 lb. caustic soda, dissolved in a few gallons of water; this is added to 150 gallons of water. The solution is sprayed on paths, &c., through the rose of a watering can, at the rate of one gallon to ten square yards.

Visitors.—On Sunday, 11th December, we counted the number of persons coming into the Domain, between 2 and 5 o'clock p.m., at the two principal gates only, viz., Macquarie-street entrance and St. Mary's Road entrance, and found as follows:—11,140 pedestrians, 196 vehicles, 56 bicycles, and 7 equestrians (5 gentlemen and 2 ladies.) The day turned out dull and cloudy, and there was no band or any special attraction in the Domain.

Government House Gardens.—The gardens about Government House have been well attended to by three men under a gardener-in-charge (Mr. Helps). The lawn and tennis-courts, &c., have been kept well mowed and rolled; the flower beds and green houses have been kept well furnished, and a fair supply of cut flowers and pot plants has been always available.

Several garden walks have been turned over, ballasted, and gravelled, and new turf edgings have been laid where necessary.

The condition of the grounds certainly shows an improvement on that of the preceding year, in spite of the fact that the climatic conditions have not improved.

Miscellaneous.

Miscellaneous.—Besides the Inner and Outer Domains and gardens at Government House, Mr. Jones has under his supervision several small plantations, grass lawns, shrubberies, and flower borders at various public buildings about the city of Sydney. My sub-department is also called upon to supply information, plans, and supervision in regard to the laying out or improvement of grounds at various Government institutions in the country—gaols and railway stations, &c.—and suitable trees and plants for the same are frequently supplied from the Botanic Gardens.

The most important outside works undertaken during the past year are the Court-house grounds at Newcastle and the grounds adjacent to the Caves house at Jenolan.

Garden Palace Grounds.

The year 1898 has been a particularly trying one, and will be long remembered by the staff on account of its almost continuous dryness, consequent upon the scanty rainfall during that part of the season when it was most needed. Although, by dint of careful watering, a fair succession of flowers was maintained in the more important parts of the grounds, the lawns unfortunately were very frequently brown, thus materially detracting from their appearance. However, little of any consequence was lost, and, owing to a fairly good pressure of water, few trees or shrubs of value suffered very severely.

Water Supply.—The matter of draining the fountains round the statue of Governor Phillip is a work of some importance. When the statue was completed, as referred to in my last Report, it was considered advisable to conduct the spent water from the fountains into an adjacent main drain, in accordance with an arrangement undertaken some time ago. It, however, appeared to me that the water might be utilised for the purposes of the Botanic Gardens.

It may not be generally known that the ponds in the Botanic Gardens possess no regular supply of fresh water, either to ensure the prevention of stagnation or even to compensate for that lost by soakage and evaporation. With the exception of the spent water discharged by the Mint in Macquarie-street, which is drained from that Institution into the Garden Creek, and thence to the ponds, and also a small, almost inappreciable quantity of waste from the drinking fountains, the rain is depended upon for keeping the ponds supplied. Consequently, when the rainfall is slight, as for instance during the last summer, the very undesirable result is the stagnation of the pond water. Not only is the water itself badly coloured by reason of the minute animal and vegetable life with which it teems at such times, but the smell arising therefrom is very disagreeable, and it may also be detrimental to the public health.

It occurred to me that the waste water from the Phillip fountains might with advantage be used for flushing the creek, and thus for replenishing the ponds. Accordingly, a service consisting of 6-inch glazed drain-pipes, was laid down, the joints being well cemented to prevent the ingress of roots, &c. The course of the drain is from the statue in the direction of the picket fence on the southern boundary of the grounds to a point about 70 yards from the main gates, and from thence parallel with the fence through the Garden Palace Grounds and the propagating reserve to the head of the creek in the Botanic Gardens, where it discharges. Although the water is not absolutely sufficient to thoroughly remedy the state of things to which I have referred, as the supply is intermittent (being only available for two or three hours twice a week), yet the result answers my expectation, and is, I am fully convinced, a step in the right direction. While referring to the matter, I feel moved to record my conviction that the existence of this stagnant water at certain times in the Botanic Gardens ponds should not be permitted to continue. The remedy, of course, is a constant supply, whenever needed, of fresh water. This will certainly entail expense, but perhaps some arrangement may be come to with the Water and Sewerage Board by which a sufficiency of pure water may be available, at all times during the year, to keep the creek and chain of ponds in a perfectly wholesome condition.

The following is the registered water supply during the year:—

	gallons.
Meter No. 206	980,000
(The Governor Phillip Fountain is not separately controlled by meter.)	
Meter No. 253. Lawn near Governor Phillip's Statue	36,000
Total	1,016,000

Removal of Fence between Garden Palace Grounds and Botanic Gardens.—It being evident that the iron-railing fence separating these grounds on their north-eastern boundary from the Botanic Gardens was an unnecessary obstruction to the public, and that it materially interfered with the landscape views in this direction, I caused the fence to be removed. The fence, being in thoroughly good order, was re-erected in place of the old and unsightly corrugated galvanised-iron fence which had hitherto divided these grounds on their east side from the Botanic Gardens. I have reason to conclude that these changes, although small in themselves, have largely contributed to the comfort of visitors, and have added much to the attractiveness of the scene between the Garden Palace Grounds and Farm Cove.

Eventually the removal of these fences will necessitate some alterations in the direction of new walks and borders, &c., in order to adjust some anomalies which at present exist, partly in consequence of the alterations, the two gardens having been laid out at different periods, and to some extent independently of each other.

Painting.—During the month of December all the boundary fences, railings, and gates of these grounds were cleaned and painted by a number of temporarily employed men, under the supervision of the Government Architect. This work has vastly improved the appearance of the place. The Phillip statue, together with all the statuary, vases, &c., of these grounds, were thoroughly cleaned and renovated by the same men.

Top Dressing of Lawns.—This work has been proceeded with as far as opportunities would allow. The small lawn on the eastern side of the main walk leading from the principal entrance has had a large quantity of soil carted on to it, removing to a great extent the inequalities and depressions which had resulted from the settling of the ground; also, the lawn on the western side of the same walk received a slight dressing, which I intend to supplement as soon as material is available. The small lawn between the palm-bed and the main walk near the entrance to the Botanic Gardens has also received attention, a large quantity of soil having been carted on to it, raising it to its normal level.

Soil for New Border.—The shrubbery in the south-east portion of the grounds referred to in my last Report has since been filled with the necessary soil, and is now only waiting the planting season for the work to be completed.

Centennial Park.

Tree-planting.—This work has not been neglected during the past season, trees to the number of 190 having been planted. The names and numbers of the species are as follows:—

Port Jackson fig (*Ficus rubiginosa*)	143
Moreton Bay fig (*Ficus macrophylla*)	6
Live oak (*Quercus virens*)	17
Coral tree, several species (*Erythrina*)	21
Stone pine (*Pinus pinea*)	3
Total	190

These trees have been treated liberally in the matter of soil, upon which the sum of £122 3s. 6d. has been spent, at the rate of 4s. 6d. per cubic yard. The Park consists of nearly pure sand, and all trees have been planted in a sufficiency of good soil, without which vigorous arboreal vegetation cannot be established.

It will be observed that the trees above enumerated are all of what may be termed common species, and perhaps some persons may consider that we should aim at planting a larger number of kinds. This has already been tried, and has proved a failure. For the present, or until such time as the hardy trees afford some shelter, only very hardy trees will survive in the bad soil and bleak exposure of the Park.

All the trees planted in 1897 are growing nicely. The experiment made of planting *Acacia* (wattle) and *Casuarina* (she-oak) seedlings has been fairly successful. *Acacia Baileyana* has thriven splendidly; the plants are now about 9 feet high, and covered with flower buds. They should make a grand display of golden-yellow bloom about the month of August.

Acacia binervata and *decurrens* have both made good growth; but, although they are fine, healthy plants, no flower buds have yet made their appearance. *Acacia longifolia* has, however, proved a failure so far, owing principally to the attacks of insect pests, to which this species seems to be extremely susceptible. *Casuarina quadrivalis* has made excellent growth, and if clumps of this plant can be successfully grown, they will form quite a feature in the Park. As regards the Broad-leaved Tea-trees (*Melaleuca leucadendron*) planted in 1897, they are growing splendidly, being now over 6 feet high, and much is expected of them in damp situations in the Park, where they are planted mainly as break-winds.

Tree-guards.—During the past year iron tree-guards to the number of 120 have been purchased, and nearly the whole of them have been put in use. Additional tree-guards will be required during the coming year to protect freshly-planted trees and to replace as many as possible of the temporary wooden ones, which it is my desire to abolish altogether.

Protection of Native Vegetation.—Last year I drew attention to the desirability of protecting the knolls of indigenous vegetation in the centre of the Park. Up to the present it has not been possible to set apart a sum of money for the purpose of fencing these interesting spots. In a few years it will be too late, and during the past twelve months many plants have been trodden down and otherwise destroyed. It will be very pleasing to me if in my next Report I am able to state that a beginning has been made with this very necessary work.

Native flower plantation.—In anticipation of provision being made for iron fencing for a native-flower plantation, plants indigenous to the Colony are now being raised in pots in the propagating ground, and it is hoped that during the coming year we may see our anticipations in this matter realised. In this way the Park will have a directly educational value, as all the plants will be properly labelled, and I do not doubt that the public will appreciate the innovation.

Collection of native grasses, Cyperaceæ, &c.—From time to time plants of native grasses have been collected, potted, and sent to the Botanic Gardens to augment the collection of native grasses there. Many plants of the orders *Restiaceæ* and *Cyperaceæ* have been collected and sent to the Botanic Gardens to supplement the collections in the Monocotyledonous portion of the Arrangement Ground. I take this opportunity of commending the good work that Mr. William Forsyth (the overseer) has done in this direction, and he has also busied himself with the collection of native seeds and of botanical specimens.

Effects of the continued drought.—Once more I have to record a very dry year. The effect on the Park has been very marked; the plants all suffered more or less, the annuals being, of course, the greatest sufferers. The grass gradually acquired a brown appearance, and the ponds—a conspicuous feature in the Park—have not been so empty since the formation of the Park ten years ago. So far as the ponds were concerned, however, the evil was not an unmixed one, as the absence of the water afforded an excellent opportunity of largely eradicating a plant which has been a nuisance in the ponds for a long time, viz., *Helocharis sphacelata*, R. Br. This plant has given much trouble to destroy. Frequent mowing of the stems has been tried, but little headway has been made by this method, and pulling it out by the roots seems to be the only effective way of dealing with it.

As is usual in protracted dry weather, the macadamised portion of the Grand Drive suffered severely, and many were the complaints of cyclists and drivers of vehicles at the presence of numerous small, loose stones on the road, which every endeavour was made to minimise.

Tarring and metalling of roads and paths.—The expenditure under this head has been very heavy during the past year. The conversion of the macadamised portion of the Grand Drive into an asphalted road has been strenuously pushed on, with the result that 37 additional chains have been completed. This distance includes what is known as Cleveland-street entrance, a length of 27 chains, which a year ago was in a very bad state, but this piece of road will, I have no hesitation in stating, now compare favourably with any road of a similar width and length anywhere. The costly nature of these improvements may be inferred when it is stated that the road is 33 feet wide, and that this road has to be covered with a layer of blue-metal, then with a layer of tarred rough blue-metal screenings, and lastly floated all over with tar. The customary repairs to other roads and paths as well as floating them with tar has not been neglected. The total quantity of tar used during the year amounted to a little over 12,000 gallons.

Road between Queen and Ocean Streets.—The large reservoir for the Sydney Water Supply being now completed, it is necessary to form and complete the road inside the Park between the Queen-street and Ocean-street entrances. I trust that funds will soon be forthcoming for this most desirable work, as the road is required to complete and connect those round the inside of the Park, added to which the views from the site of the proposed road are of a charming character.

The

The Ride.—The Ride, in common with the rest of the Park, suffered severely from the drought; but it is a matter for satisfaction that during the year it has not been found necessary to close it. The tracks or ruts have not been so pronounced as in former years, and if riders would endeavour to avoid each others tracks, I feel confident it would not be found necessary to close the ride at all—at all events on very rare occasions.

Cyclists.—In my last Report I had to complain of cyclists using the footpath, to the detriment of pedestrians, and also of scorchers endangering even the lives of people. I am pleased now to state that the evils complained of have almost disappeared.

Erection of buildings.—During the past year a shelter pavilion similar to that in the Garden Palace Grounds has been erected at a cost of about £400. It is situated on a prominent site at the junction of three embankments near the centre of the Park, and is already much appreciated by the public. They have now a comfortable building in which to rest, and its situation is such that it affords convenient shelter to those who are overtaken by rain. Its design is very pleasing and it is an ornament to the Park. A picturesque brick cottage with red tile roof, to be used as a residence for the Senior Ranger, has been commenced. This cottage occupies the site of an old building previously occupied by him, but which was condemned as unfit for further habitation. The site is a commanding one near the end of the straight road from the Cleveland-street entrance, its situation enabling its occupant to keep in view a large area of the Park.

Band-stand.—I am still anxious to see a band-stand erected. The lack of one prevents bands from coming to the Park, and on the few occasions on which a band has played, the number of people who came to listen was very large. If a proper band-stand were erected, I do not doubt that the Permanent Artillery Band, and several excellent bands in the city and suburbs, would occupy it, and afford visitors opportunities of hearing good music. It is not easy to exaggerate the advantage to the public health and happiness which is secured by attracting large crowds of people into a beautiful park, and recreating them with sweet music.

Latrines.—This is another matter which I again recommend for serious consideration. The absence of suitable latrines for both the employees and the public should not be allowed to continue in the premier park of the Southern Hemisphere. In saying this, I am aware of the difficulty which the levels of the Park present in regard to the substitution of a scheme of main drainage in lieu of the pan system now in operation.

Reservoir (Sydney Water Supply).—This important work, described in my last Report, has now been completed, and forms a conspicuous and not unattractive object in the Park. The roof has been covered with turf, and from this roof and the terrace outside the reservoir proper enchanting views of the Park and surrounding country towards Botany Bay are afforded. I pay frequent visits to this place in the course of my official duties, and never tire of the view, feeling that it is one of the most beautiful with which I am acquainted. Contemplation of such beautiful scenery must tend to elevate the minds of every citizen who chooses to enjoy it.

Statuary.—During the past year some evilly-disposed person or persons pushed over one of the four statues of the "Seasons," situated near the centre of the Park. The statue was badly broken, but it has been skilfully repaired, and has been replaced on its pedestal. This is the first occasion on which any of the statues have been knocked over, and it may be stated that, with such a large area open to all sections of the public, the Park has been singularly free from vandalism.

Water Fowl.—During the last year one of the black swans hatched, and successfully reared, a brood of cygnets. The interest taken in these cygnets by the public warrants the suggestion that it would be very desirable to have a small pond properly fenced and reserved for the swans. At present they are not confined to any particular pond and are liable to be annoyed by boys, and perhaps worried by stray dogs.

State Nursery, Campbelltown.

Distribution of Plants.—The plants raised and sent to the Botanic Gardens for planting out and distribution during the year numbered 84,131 (trees, shrubs, bulbs, and tubers), and notwithstanding the severity of the season, the plants referred to were of excellent quality.

Preparation of Plants for Season of 1899.—The stock of plants now being prepared for distribution during the winter of 1899 is of extra fine quality, and embraces a greater variety of plants than in previous years.

Seeds and Plants received.—About 300 species and varieties of seeds and plants were received during the year from twenty-seven contributors. Many these will be of value for the purposes of the nursery.

The Weather.—The year opened in the midst of a very severe drought, very little rain having fallen during the last three or four months of the previous year. During the month of March very fair rains fell, which greatly benefited the nursery stock and left the ground in good condition for the work of transplanting stock, seedlings, cuttings, &c. After good rains during the winter and spring months, another very severe drought set in as the season advanced and continued until the end of the year. This has proved the most severe drought known to Mr. McEwen, the Superintendent, during his residence at the Nursery of fifteen years.

Water Supply.—Following is the registered water supply during the year:—

	gallons.
Meter No. 268	265,000

Improvements.—Additions have been made to the bush-house accommodation, but more is required. The oldest structure, built fifteen years ago, required to be renewed, as it has become rotten and unfit to repair. Additional ground has been broken up for the purpose of planting specimen trees to form a small arboretum. These the Superintendent hopes to plant during the winter of 1899. Application has been made for a small brick office (the room at present used for this purpose being unfit for the preservation of books and papers), but this has not yet been carried out.

Sydney: William Applegate Gullick, Government Printer.—1899.

[1s. 3d.]

Sydney, Botanic Gardens, Report 1898 (P:Biol:S)
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